AN EXPLORATORY STUDY OF THE RELATIONSHIP BETWEEN EPISTEMOLOGICAL BELIEFS AND SELF-DIRECTED LEARNING READINESS

by

CARRIE J. BODEN

B.A., Bethel College, 1994
M.F.A., Wichita State University, 1998

AN ABSTRACT OF A DISSERTATION

Submitted in partial fulfillment of the

requirements for the degree

DOCTOR OF PHILOSOPHY

College of Education

KANSAS STATE UNIVERSITY

Manhattan, Kansas

2005

ABSTRACT

The purpose of this study was to investigate the relationship between demographic and educational variables, epistemological beliefs as measured by Schommer's Epistemological Questionnaire (SEQ), and learner perception of self-directedness as measured by Guglielmino's Self-Directed Learning Readiness Scale (SDLRS). Participants in this study were undergraduate adult students at a private university in the Midwest region of the United States (N=394). The instruments were administered online during regularly scheduled courses. Data were analyzed at the $p<.05$ level of significance using Pearson product-moment correlations, factor analysis, stepwise multiple regression, and other statistical techniques.

Results of this research included several significant correlations between demographic and educational variables, SEQ factors, and SDLRS total and factor scores. The educational variables of class standing, exposure to the humanities, and exposure to the social sciences significantly correlated with five SDLRS and SEQ total and factor scores. The greatest number of correlations occurred between SEQ factor 2, thinking for yourself is a waste of time, and the SDLRS factors of openness to learning opportunities, view of self as an effective and independent learner, independence and initiative in learning, responsibility for learning, and creativity. Other significant correlations with SEQ factors and SDLRS total and factor scores included age, gender, race, marital status, mother's and father's education level, credit earned through independent studies, cohort or non-cohort program type, grade point average, and exposure to learning contracts.

Significant findings from the correlations of demographic and educational variables ($p<.002$) and SEQ factors ($p<.05$) with SDLRS total scores were entered into a

stepwise multiple regression. One educational variable and three SEQ factors accounted for 25.7% of the variance in SDLRS total scores.

Several suggestions for the development of expanded empirical and theoretical research initiatives and the improvement of practice were offered. This research provided a clear and compelling rationale for the establishment of adult degree programs which are grounded in the liberal arts, include both career and personal development activities, and allow for increased opportunities for learner self-direction to occur. These elements are necessary to build what Kegan (1994) called a developmental bridge for adult learners.

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Approved by:

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Major Professor

Dr. Jacqueline D. Spears

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At first glance, the writing of a dissertation appears to be a lonely activity. One conjures the image of the student in a desolate room hunched over the computer among stacks of photocopies, reams of notes, and the remnants of yesterday's sandwich. This image is well-earned in that it accurately depicts the solitary act of writing and the rigor of the research process. However, there are also many subtle factors outside of the writing and research processes that contribute to the completion of a dissertation. Although I was often in this solitary state during the writing of this work, a closer look reveals that because of the outside support I received, I was never really alone. I had many cheering me on and assisting me along the way. I learned that it takes the dedication and will of many to see a project such as this one through to completion, and I certainly have a long list of people to acknowledge and thank for their contributions.

First, I am exceedingly grateful to Dr. Jacqueline Spears, dissertation advisor, mentor, and woman extraordinaire. Jackie was everything that I could ask for in an advisor. She was attentive, efficient, and selfless; she intuitively knew when to challenge and when to encourage me. I was constantly amazed by her adeptness at guiding me through this process and at her generosity in sharing her expertise, energy, time, and home. In my apprenticeship with Jackie, I have learned so much about the world of academia and research, and I have certainly learned about how to put together a document such as this one. Although notable, these are not the lessons that have had the greatest impact on me. She has taught me about how to be an effective leader and how to a find a sensible approach to conquering seemingly insuperable barriers. One of the most important lessons I have (re)learned from Jackie is what an important, transformative,

and affirming endeavor it is to work with, nurture, and engage others. Jackie is a model of how to deliver serious content knowledge with love and respect, and she is a true example of walking the educational talk. Jackie is an inspiration and a reminder of why I sought out this degree.

I would like to thank the many other people at Kansas State University who have made this accomplishment possible. I am very appreciative of the work of the members of my committee, Dr. Mary Evan Griffith, Dr. Tweed Ross, and Dr. Jane Fishback, who have been continuously engaged in this process. I am grateful to this committee and to the outside chair, Dr. Anne Phillips, for the countless hours spent pouring over drafts. I want to thank various professors I've encountered while enrolled in the program for their contributions to my education. Dr. Sue Slusarski first evoked my interest in adult education, and it was in Dr. Kathy Rager's seminar that I became interested enough in self-directed learning to make it the topic of my dissertation. Likewise, Jane's Social Foundations course was a continuation of my previous coursework and rekindled my interest in epistemology. The statistics courses with Dr. Marlene Schommer-Aikins and Dr. Kevin Emery were the impetus for my interest in quantitative research, and it was in a course with Marlo that I first started formulating my research questions about how self-directedness and personal epistemology might be connected. I owe Marlo many thanks for the use of her instrument. Last, and certainly not least, I would like to thank Dr. W. Franklin Spikes, my coursework advisor and mentor, for everything he has contributed to my education and to my career. In February of 2002, Frank traveled to Wichita to meet with me to map out my plan of study; the plan we drew out together has now come to fruition. I will carry with me the image of the KSU faculty driving to Wichita to deliver

the adult education program. This image of conquering distance in order to meet students where they are is a metaphor that guides my daily work. This is just one of the many things I have learned about what it means to be an adult educator.

There are many other educators from my past that I wish to acknowledge. I owe debts of thanks to Doris Meng, Connie Reimer, Dr. John Sheriff, Raylene Hinz-Penner, Albert Goldbarth, Dr. Carol Wolfe Konek, Dr. Debbie Gordon, and Dr. Chris Brooks. These people have left their marks on me in enduring and identifiable ways; that which that they have taught me is somewhere in this work. This project has truly been a synthesis of the whole of my schooling, and I have used my skills as a poet, mathematician, literary critic, social scientist, and theorist.

I have had much support from Friends University over the past four years. When I first enrolled at KSU, Dr. Robert Dove offered an institutional commitment to my Ph.D. work and financial support for this endeavor. I am very grateful for this initial investment and for the continued support from Friends University regarding my professional development. I wish to formally thank Dr. John Yoder, Vice-President of Academic Affairs, for his continuous commitment and support. I especially want to thank Dr. Yoder for approving the grant that funded this research. Without the release time, research assistance, and other assistance the grant enabled, it would have taken much longer for me to complete this project. I am truly, truly grateful for this investment. Another fine leader, Dr. Sean Warner, has been exceptionally supportive. It is because of Sean's leadership, encouragement, and belief in this project that I have been able to move forward and to connect my dissertation research with initiatives in the College of Adult

and Professional Studies. I owe a huge debt to Sean and to Dr. Janice Hilyard for all of the support that I've received from CAPS during the past year.

I wish to thank Bonnie Dexter, whose hard work, organizational skills, and administrative support kept this research moving along. Bonnie cheerfully and promptly completed whatever large or small project that I needed her to do—even when it was most certainly not something in her job description. Additionally, Bonnie supervised and directed the student workers, Brent Stephenson, Dorothy Crystal Coles, and Megan McDonald, whose clerical support was indispensable. I so appreciated their willingness to complete the many insanely boring but necessary tasks that I delegated to them.

I am grateful to the research assistants who contributed to this project. I appreciate the many hours Suzanne Miller, Cristin Dorsing, Amber Harshbarger, Corby Davis, Mary Proctor Dehn, and Rachel Lofland spent administering the surveys. Their many hands made lighter work of the survey administration, and without their support, it would have been impossible to adhere to such an ambitious data collection schedule. I am also thankful that Sharon Lopez, Michael Briggs, Judith Gordon-Omelka, Edgar Morales, and Tony Lubbers administered the survey during their classes. I am equally appreciative of the work Amber and Suzanne dedicated to proof reading various drafts of the dissertation and to checking sources. Even though this was mind-numbing work, they took on the challenge with great enthusiasm and flare. Finally, I would like to thank Charles Lambdin for his assistance with the statistical analyses; his sarcastic sense of humor and quirky stat trivia kept me calm and made a potential time of extreme stress a jovial and enjoyable stage of the research.

Many other people at Friends University have been unbelievably supportive at various times. My cohorts in Ph.D. programs, Deirdre King Hainsworth and Carolyn Schmidt, have offered advice, encouragement, camaraderie, and peer-group support during this process. I wish to thank the inter-library loan librarians, Valorie Starr and Rhonda Bethel, for their steadfastness in procuring resources. I also want to thank the many colleagues and adjunct instructors who have been inquisitive, understanding, and caring; seemingly small gestures and comments have meant the world to me. I especially want to thank my students, whose and desire to learn has inspired me and has reminded me of how much I love teaching; this has kept me moving forward at times when I was tempted to give into exhaustion.

I have my family and many friends to thank for supporting me, for encouraging me, and for understanding the incredible amount of alone time that a dissertation requires. I am amazed at how many people have been willing to work around my crazy schedule and have been patient with my eccentricities. During the past year, I had my own cheerleading team—the voices of Dr. Jerry Smartt and Dr. Gretchen Eick—telling me that I would finish; these voices of those who had done this before me brought me a sense of equanimity, stability, and hope. In addition to providing support, Gretchen, Mike, Jerry, and Dan often kidnapped me for much-need distractions, fine meals, and great movies. Other friends offered much as well. Cristin Dorsing was relentless in her support, and she kept me clothed, fed, and groomed as she was willing to sacrifice leisure time for what became our main social activity, errands. Pam Peppard has contributed to this effort in countless ways—more than I would be able to name here. Her woman's work of cleaning, laundry, cooking, and dog rearing have made my woman's work of

dissertation writing possible. Pam has been a loyal friend, confidant, support system, and travel-buddy. My family has been tremendously understanding and supportive as well. I especially want to thank my mother for planning a vacation to celebrate the completion of my schooling. The impending Mexico trip kept me motivated at times when I inevitably would have drifted off-task.

Although writing a dissertation seems like a solitary activity and singular achievement, in my experience it has been, in fact, quite the opposite. Amid the hours of writing in solitude, I have been blessed with a community of people who have encouraged and sustained me. Inherent in this work are the many things that others have done to make this dissertation possible.

CHAPTER 1

Introduction

> *We cannot simply stand on our favored side of the bridge and worry or fume about the many who have not yet passed over. A bridge must be well anchored on both sides, with as much respect for where it begins as for where it ends.*
>
> (Kegan, 1994, p. 62)

This study investigated the relationship between demographic and educational variables, learner perception of self-directed readiness, and learner epistemological beliefs. This chapter provides an overview of the study including relevant background information, statement of the problem, statement of purpose, research questions, significance of the study, limitations of the study, and definition of terms.

Background

Participation in formal adult education has been increasing over the past three decades (Creighton & Hudson, 2002; Dover, 2004; Kim & Creighton, 2000). The first national survey of formal and informal adult education conducted by Johnstone and Rivera (1965) found that 22 percent of American adults participated in some form of adult education. Since 1969, the National Center for Education Statistics (NCES) has collected data about adult participation in formal learning through the National Household Education Surveys Program (NHES). In 1969, 10 percent of the adult population participated in formal education, and by 1984 that number had risen to 14 percent (Kim, Hagedorn, & Williamson, 2004, p. 8). The number of adults participating in formal adult education has continued to climb. The 1995 NHES survey revealed that

40 percent of adults participated in formal education; in the 1999 NHES survey that number increased to 45 percent (Kim, Collins, Stowe, & Chandler, 1995; Kim & Creighton, 2000). Kegan (1994) pointed out that "according to the College Board's Office of Adult Learning Services, those 25 and older constitute the largest and most rapidly growing education sector in the nation" (p. 271).

Simultaneously, theorists such as Kintz (1999) and Davidson and Goldberg (2004) have claimed that there is a trend of educational and intellectual backlash among many employers and business leaders who view learning and thinking—particularly in the area of the liberal arts—as an elitist activity disconnected from the real world of business and gainful employment. Kintz (1999) argued that the cultural expectation is such that the liberal arts are seen as luxuries, and critical thinking is often characterized as "something [students] will get over after graduation when [they've] found a real job" (para. 3). In such an environment, students often want information instead of knowledge, and employers often believe they want new graduates possessing specific skill sets instead of intellectual well-roundedness.

Yet, it is apparent that for the demands in the modern change-oriented workplace, specialized training or vocational education are the not the best course of action. Specific skills and once state-of-the-art training will quickly become obsolete. Spence (2001) contended that in today's rapid-paced society the shelf-life of knowledge is short, and this has changed the workplace. Spence (2001) explained graduates' need for continuing education when it was pointed out that "where four years [of learning] used to suffice, the 40 years of a working lifetime is now the standard" (p. 12). It is the ability to learn how to learn that will be increasingly important in a world where learning organizations are

the norm, an average person changes jobs five times in his/her lifetime, and one must continuously learn in order to keep up with the ever-growing digital divide and new technologies" (Walsh, 1998, para. 2). Businesses need graduates who are "constant, active, and adaptive learners" (Spence, 2001, p. 18). According to Howard Block of Bank of America, learning is "almost the sole source of competitive advantage" (as cited in Spence, 2001, p. 18).

Carnevale, Gainer, and Meltzer, in their book *Workplace Basics: The Essential Skills Employers Want* (1990), argued that knowing how to learn is perhaps the most important attribute a student can possess. Carnevale et al. (1990) contended that "individuals who know how to learn can more easily acquire other skills. Without this essential skill, however, one's learning is not as rapid or as comprehensive and long lasting." Many writers and researchers (Davidson & Goldberg, 2004; Kegan, 1994; Kintz, 1999; Spence; 2001; Walsh, 1999) suggested that the ability to learn and to solve problems is essential. Cristiano (1993) wrote that "for students to survive in a changing world, the goal of education should be not only [for teachers] to impart . . . knowledge of their fields of study to their students but also to teach their students how to learn and to solve problems relevant to their subject areas" (p. 5).

In his 1994 work, *In Over Our Heads*, Kegan identified questions of how providers of adult education can best respond to the expectations of employers and students. Specifically, Kegan questioned what transformative learning and the goal of self-directed learning mean within the context of adult education. Kegan (1994) wrote that adult education is a

> field of practice paralyzed by what it perceives as a choice it does not want to make: shall it support its traditional noble mission—the liberation of the mind and the growth of the student—at the risk of losing a large portion of its adult clientele, who will feel that what it has to offer is irrelevant to and neglectful of their practical adult needs? Or shall it respond to what it perceives as its adult clients' demands for practical training, expedient credentialing, increased skills, and a greater fund of knowledge at the risk of demoralizing or losing its best teachers, who are dismayed to find their career identities being refashioned according to those of vocational education? (p. 273)

The critical mission of adult education, Kegan argued, is personified by the self-directed learner. Brookfield (1985a) also posited this notion when he wrote that it is common for adult educators to declare "self-directed learning [as] the goal and method of adult education" (p. 5). Kegan (1994) suggested that adult educators may find a way around the forced choice of a "practical" and "mind-liberating" curriculum if "the goal of 'self-direction' is reconceived as a fostering of the order of consciousness that *enables* self-direction" (p. 274). Kegan (1994) claimed that the "burdens we face at home and at work" are not best faced with a particular set of skills, techniques, or specialized information. Adults who enter learning settings with a need to meet practical, real-life demands need "the transformation of mind their instructors, as liberal educators, are dedicated to encouraging" (p. 275). Kegan (1994) concluded that if adult educators

> would not seek so much to train for self-directed learning but to *educate* for the order of mental complexity that enables it, this might well constitute the most

effective way to address the very “practical” aspirations of adult learners. (p. 275, emphasis in the original)

Perhaps the answer to the conundrum of creating active, life-long learners is not best addressed by providing increasingly specialized training. Rather, providers of adult education should aspire to provide a strong foundation in the liberal arts, to emphasize the development of skills for learner self-direction, to support students in the development toward self-authorship, and thus to provide the basis for workers in the new economy to have the ability to apply such knowledge and skills to a variety of employment venues.

In the article “A Manifesto for the Humanities in a Technological Age,” Davidson and Goldberg (2004) discussed the importance of a liberal arts education as a foundation for understanding and embracing diversity, comprehending and shaping social policy, valuing creativity and problem solving, and all-around preparing students to become good and productive citizens. Central to these abilities, the authors argued, is the opportunity to experience the world broadly--as an interconnected, interdisciplinary entity to be explored rather than as a discipline-specific piece of the larger universe-puzzle to be narrowed and quantified. A liberal arts education is not only transformative in that it grooms students to trace differences and recurring themes across disciplines, but it also prepares graduates to teach themselves to learn in many contexts.

Kegan (1994) pointed out that in a university setting, students are often expected to teach themselves. One assumption underlying this practice is that adults come to the university prepared to participate in self-directed learning projects. Likewise, it is commonly assumed that adults enter college prepared to engage in internships, service

learning, or experiential learning, or it is assumed that adults are ready to receive college credit for reflecting on and theorizing about their previous life experiences. Self-directed learning projects are often embedded into existing coursework through the utilization of learning contracts (Berte, 1975; Caffarella & Caffarella, 1986; Knowles, 1975, 1980) or through less explicit self-directed assignments and coursework. Knowles (1986) stated that learning contracts are process-oriented:

> Contract learning is, in essence, an alternative way of structuring a learning experience. It replaces a content plan with a process plan. Instead of specifying how a body of content will be transmitted (content plan), it specifies how a body of content will be acquired by the learner (process plan). (pp. 39-40)

Additionally, students may earn university credit through completing independent studies or through utilizing other self-directed techniques, such as experiential learning as demonstrated through use of the Kolb model (Kolb & Fry, 1975) or similar models like the one proposed by Jarvis (1995). Experiential learning involves a "direct encounter with the phenomena being studied rather than merely thinking about the encounter, or only considering the possibility of doing something about it" (Borzak, 1981, as cited in Brookfield, 1983). The practice of issuing credit for experiential learning is wide-spread; more than 250 colleges and universities nation-wide are members of the Council for Adult and Experiential Learning (CAEL), a national "non-profit organization which creates and manages effective learning strategies for working adults through partnerships with employers, higher education, government and labor" (Council for Adult and Experiential Learning, 2004, para. 1).

Kegan (1994) suggested that adult college students are often not cognitively ready for the demands that modern universities impose upon them. For example, students may not enter college prepared to apply, analyze, synthesize, or evaluate information. Students may not be prepared to generate theories based on their own experiences (Baxter Magolda, 1998; King & Kitchener, 1994). Yet, it is considered standard practice in the field of adult education to expect students to be self-directed and to be able to gain credit through experiential learning. According to Kegan (1994), over one-half of the student population does not come to college ready to meet this demand.

It is an important undertaking to ask questions about how universities can best prepare students to meet the demands required of them in an educational setting, in their workplace, and in their lives beyond college. Despite the vast research bases in the fields of adult education, self-directed learning, cognitive development, and personal epistemology, very few studies have combined these fields. Research synthesizing aspects of these areas forms important building blocks for the field of adult education. For example, a significant aspect of this research is the study of personal epistemology. Building on the work of Perry (1968), researchers in the field of personal epistemology have studied how personal epistemological beliefs are related to conceptions of knowledge and reality, reflective judgment, and gender differences. Drawing on this research, Schommer (1990) has proposed a multidimensional model of personal epistemology composed of a set of more or less independent epistemological beliefs. According to this theory, multiple beliefs about the structure of knowledge, the certainty of knowledge, the sources of knowledge, the control of learning, and the speed of knowledge acquisition make up one's personal epistemology, and these beliefs may

develop asynchronously and more or less independently of one another. These beliefs are measured by Schommer's (1989a, 1990) Epistemological Questionnaire.

Another essential building block for adult education includes investigating relationships between cognitive and ethical development and learner perception of self-directedness. Leeb's (1983) dissertation research linked adult learning theory, learner self-directedness, and cognitive and ethical development, specifically epistemological beliefs. In this study, Leeb (1983) investigated individuals who practiced a healthy lifestyle as measured by Dull & Hahn's (1981) Personal Health Inventory (PHI) and correlated this score with two dimensions of learning, learner self-directedness as measured by Guglielmino's Self-Directed Learning Readiness Scale (SDLRS), and cognitive and ethical development as measured by the Perry Scheme of Cognitive and Ethical Stage Development (CESD). Leeb (1983) hypothesized that as individuals moved away from dualist thinking, their perception of self-directedness would increase. This hypothesis was not supported by the data, but Leeb (1983) suggested that this hypothesis should not be abandoned because of the small sample size and the exploratory nature of her investigation. In other research at Alverno College, Mentkowski et al. (2000) supported the hypothesis that as individuals move away from dualist thinking, their developmental levels will increase. Mentkowski et al. suggested that educators who take a developmental perspective in teaching can influence a learner's long-term intellectual, moral, and integrated development. A related finding linking intellectual development and self-directedness was conducted by Shaw (1987). Shaw administered the Oddi Continuing Learning Inventory (OCLI), a measure of self-directedness, and the Measure of Epistemological Reflection (MER) (Baxter Magolda & Porterfield, 1988; Taylor &

Porterfield, 1983), a measure of intellectual development based on the Perry scheme. Shaw found that as self-directed readiness increased, intellectual development increased also.

Leeb's (1983) study is particularly relevant to this dissertation research as Leeb found many correlations between educational variables and SDLRS factors. Leeb also found that the level of formal education correlated significantly with total SDLRS scores, and several factors, such as view of learning as a beneficial process, acceptance of responsibility of one's own learning, love of learning, and tolerance of risk, complexity, and ambiguity in learning, were statistically significant. Leeb (1983) also found significant correlations with Perry's (1970) scheme. Education level was positively correlated with Perry's positions, and advanced positions in Perry's scheme were positively correlated with increasing age. Further, Leeb's (1983) findings suggested that there is a relationship between self-directedness and epistemological beliefs. Leeb (1983) found that the factor self-concept as effective learner from the SDLRS correlated positively with advanced positions in Perry's development scheme.

Statement of the Problem

The relationship between demographic and educational characteristics, learner perception of readiness of self-directedness, and learner epistemological beliefs has not yet been thoroughly explored. An exploration of these relationships can contribute to the construction of what Kegan (1994) referred to as a developmental bridge to move learners toward the goals of self-directedness, epistemological sophistication, and self-authorship. Further, these relationships can play a role in the establishment of a set of

practices in adult education for meeting the practical needs of adult students in a liberal arts context.

Statement of the Purpose

The purpose of this study was to investigate whether a relationship exists between demographic variables and educational variables as measured by the Demographic and Educational Questionnaire, learner perception of self-directedness as measured by the Self-Directed Learning Readiness Scale (SDLRS), and epistemological beliefs as measured by Schommer's Epistemological Questionnaire (SEQ). Demographic variables included age, gender, race, marital status, socioeconomic status, and rural or urban residence. Educational variables included class standing, grade point average, parents' educational level, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of educational program.

The exploratory findings in this study contribute to understanding and quantifying the relationships between demographic and educational variables, epistemological beliefs, and learner perception of self-directedness. The exploratory findings from this study enable educators, policy makers, and researchers to name and to quantify the relationship between demographic and educational variables, epistemological beliefs, and self-directedness, to develop practices to aid epistemological sophistication and self-directedness, and to study these relationships further. Significant relationships identified from this study contribute to the development of an abbreviated instrument that will allow universities to adequately place students and to develop curriculum that promotes epistemic growth and self-directedness. This instrument and the findings from further research will facilitate universities with similar adult populations in making informed

decisions about curriculum and course development without having the expense and logistical issues associated with administering the SDLRS and the SEQ to every student.

Research Questions

The research questions for this study emerged out of an extensive review of the adult education, self-directed learning, cognitive development, and personal epistemology literatures.

Primary Research Question

1. Does a relationship exist among demographic variables, educational variables, learner perception of self-directedness, and learner epistemological beliefs? If so, what is the nature of this relationship?

Secondary Research Questions

2. Is there a statistically significant relationship between learner perception of self-directedness as measured by the Self-Directed Learning Readiness Scale (SDLRS) and the demographic variables of age, gender, race, marital status, parents' education level, and rural or urban residence?
3. Is there a statistically significant relationship between learner perception of self-directedness as measured by the SDLRS and educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program?
4. Is there a statistically significant relationship between the factors outlined in the SDLRS—openness to learning opportunities; self-concept as an effective learner, initiative and independence in learning, informed acceptance of

responsibility for one's own learning, love of learning, creativity, positive orientation to the future, and ability to use basic study skills and problem-solving skills—and the demographic variables of age, gender, race, marital status, parents' education level, and rural or urban residence?

5. Is there a statistically significant relationship between the factors outlined in the SDLRS—openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, positive orientation to the future, and ability to use basic study skills and problem-solving skills—and the educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program?
6. Is there a statistically significant relationship between the factors outlined in the Schommer Epistemological Questionnaire (SEQ)—the truth is clear and unambiguous, thinking for yourself is a waste of time, learning does not require effort, knowledge should come quick, and intelligence is static—and the demographic variables of age, gender, race, marital status, parents' education level, and rural or urban residence?
7. Is there a statistically significant relationship between the factors outlined in the SEQ—the truth is clear and unambiguous, thinking for yourself is a waste of time, learning does not require effort, knowledge should come quick, and intelligence is static—and the educational variables of class standing, grade

point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program?

8. Is there a statistically significant relationship between learner perception of self-directedness as measured by the SDLRS and learner epistemological beliefs as measured by the SEQ?
9. Is there a statistically significant relationship between the factors outlined in the SEQ—the truth is clear and unambiguous, thinking for yourself is a waste of time, learning does not require effort, knowledge should come quick, and intelligence is static—and the factors outlined in the SDLRS—openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, positive orientation to the future, and ability to use basic study skills and problem-solving skills?
10. Is learner perception of self-directed learning readiness as measured by the SDLRS predicted at a statistically significant level by learner epistemological beliefs as measured by the SEQ and by selected demographic and educational variables?

Significance of the Study

This research explored the extent to which students' readiness for self-directed learning was related to their personal epistemological beliefs and relevant demographic and educational variables. This study contributes to the knowledge base in the self-directed learning and personal epistemology literatures. When relationships at the $p<.05$ level were found, the study contributed useful information that researchers, policy-

makers, providers of formal adult education, and providers of informal adult education can utilize to build theory and practices.

Limitations of the Study

As an exploratory study, this research has some inherent limitations, many of which will be addressed in future research. The following limitations apply to this research:

1. The results are generalizable only to populations with similar demographic characteristics, such as adult students in private colleges from the Midwest.
2. The results of this study are exploratory in nature.
3. The results of this study are limited by the use of an online survey.
4. The results of this study are limited by the accuracy and the truthfulness of the participants' self-reported data.
5. The results of this study are limited by the psychometric features of the SEQ and the SDLRS instruments.

Definition of Terms

For the purposes of this study, the following definitions were used:

1. Absolute: "Perry used the term *Absolute* (uppercase A) synonymously with Truth—in the sense of unchanging, universal, timeless facts and knowledge. The Truth was possessed by Authorities" (Love & Guthrie, 1999, p. 7).
2. Adult: A person who "perceives herself or himself to be essentially responsible for her or his own life" (Knowles, 1980, p. 24). For the purposes of this study, an adult is also defined as one enrolled in the adult programs at Friends University.

3. Adult Education: “Education that fosters critically reflective thought, imaginative problem posing, and discourse is learner-centered, participatory, and interactive, and it involves group deliberation and group problem solving” (Mezirow, 1981).
4. Andragogy: “The art and science of helping adults learn” (Knowles, 1980, p. 24).
5. Authorities: In Perry’s scheme, “*Authorities* (uppercase A) were the possessors of the right answers in the Absolute; *authorities* (lowercase a) existed in the relativistic world and derived their authority from many sources, such as power, expertise, training, wisdom, experience, and position” (Love & Guthrie, 1999, p. 7).
6. Class Standing: For the purposes of this study, class standing was defined according to the following standards: freshman (fewer than 28 completed semester hours and 56 credit points), sophomore (28-57 completed semester hours and 57-115 credit points), junior (58-87 completed semester hours and 116-175 credit points), senior (88 or more semester hours and 176 or more credit points), graduate student—master’s program (currently enrolled in a master’s degree program), and graduate student—doctoral program (currently enrolled in a doctoral program).
7. DCP Program: Cohort-based Bachelor of Science or Bachelor of Business Administration degree completion programs. Majors are available in business management (BBA), computer programming (CP), computer technology (CT), e-commerce management (ECM), organizational leadership and management (OML), and criminal justice (CJP) (Friends University, 2004, p. 119). The programs range from 13 to 24 months long.

8. Epistemology: “The study or theory of the nature, sources, and limits of knowledge” (Webster’s New World Dictionary & Thesaurus, 1998).
9. Experiential Learning: The Association of Experiential Education defines experiential learning as a process through which a learner constructs knowledge, skill, and value from direct experiences (Center for Experiential Learning, 2004, para. 1).
10. Exposure to experiential learning: For the purposes of this study, exposure to experiential learning was measured by the number of credit hours students have earned for experiential learning. The following ranges apply: 0, 1-3, 4-6, 7-9, 10-13, and 14 or more.
11. Exposure to the liberal arts: For the purposes of this study, exposure to the liberal arts was measured by how many credit hours the participants have earned in literature, art, music, history, philosophy, foreign language, psychology, sociology, political science, and government courses. The following ranges apply: 0, 1-3, 4-6, 7-9, 10-13, and 14 or more.
12. Exposure to self-directed learning: For the purposes of this study, exposure to self-directed learning was measured by how many times students have utilized learning contracts, engaged in self-directed learning activities, or earned college credit through independent or one-on-one directed studies. The following ranges apply: 0, 1, 2, 3, 4, and 5 or more times a student has used a learning contract and 0, 1-3, 4-6, 7-9, 10-13, and 14 or more credit hours earned through independent or directed studies.

13. Formal Adult Education: Learning that “takes place in educational institutions and often leads to degrees or credit of some sort” (Merriam & Caffarella, 1999, p. 21).
14. Grade Point Average: For the purposes of this study, grade point average was measured by the following ranges: A (3.6 and above), B (3.2-3.5), C (2.8-3.1), D (2.4-2.7), and F (2.3 or below).
15. Informal Adult Education: Learning that is traditionally defined as nonformal and informal, including “activities outside educational institutions, such as those found in learning networks, churches, and voluntary associations” and life experiences “from which we learn something” (Merriam & Caffarella, 1999, p. 21).
16. Learning Contract: A formal agreement between the learner and the mentor/assessor about what will be learned, how learning will be achieved, and how the learning will be assessed (Marshall & Null, 1992).
17. Liberal Arts: In this study, the terms liberal arts and humanities are used interchangeably and are defined as “those branches of knowledge, such as philosophy, literature, and art that are concerned with human thought and culture” (Humanities, 2000) and as “courses of a general or theoretical nature that are designed to develop judgment and understanding about human beings’ relationship to the social, cultural, and natural facets of their total environment” (State Education Department, 2003, p. 1). For the purposes of this study, a liberal arts education includes coursework in both the humanities and social and behavioral sciences.

18. Major field of study: “Refers to the predominant discipline or area of learning or training of a person's highest postsecondary degree, certificate or diploma” (Statistics Canada, 2003). For the purposes of this study, students selected the major field of study in which the student was currently enrolled.
19. Online hybrid courses: Describes courses that are delivered both online and on-ground. Online hybrid courses have reduced seat time and are supplemented with online materials and assignments.
20. PACE Program: The “Program for College Education . . . provides the busy adult with an opportunity to complete the first two years of college in a reasonable period of time.” An associate’s degree in general studies is available (Friends University, 2004, p. 119).
21. Parents’ Education Level: For the purposes of this study, this was measured by the highest education level completed by the participant’s parents. If neither parent has completed a college degree, the student was considered a first-generation college student.
22. Personal Epistemological Beliefs: Include not only beliefs about the nature of knowledge but also beliefs about learning, including the speed of learning and the control of learning (Schommer-Aikins, 2002, p. 109).
23. Personal Epistemological Belief System: Incorporates several areas such as (a) the multiplicity and singularity of beliefs, (b) the independence and dependence among beliefs, and (c) the domain specificity and generality of beliefs (Schommer-Aikins, 2002, p. 108).

24. Position: Perry (1970) chose to use the term *position* rather than *stage* to explain his scheme of intellectual and ethical development because position connotes a central tendency in meaning making rather than an enduring and constant pattern and structure that permeates a person's experience. Position implies the vantage point or location from which the student views the world (Perry, 1970).
25. Rural Residence: For the purposes of this study, rural residence will be defined as "communities of up to 20,000 in non-metropolitan areas, and towns of up to 10,000 with a rural character in metropolitan areas" (U.S. Department of Housing and Urban Development, 1980).
26. Self-Directed Learning: "A process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating goals, identifying human and material resources, choosing and implementing learning strategies and evaluating learning outcomes" (Knowles, 1975, p. 18).
27. Sophisticated Epistemological Beliefs: "There is a difference between sophisticated epistemological beliefs and less sophisticated epistemological beliefs. The sophisticated learner will maintain epistemological beliefs that support flexible thinking, yet underlying that ability to take in new ideas or change old ideas, will be a steadfastness of core concepts" (Schommer-Aikins, 2002, p. 113).
28. Type of program: For the purposes of this study, a program will be defined as a cohort based (DCP) or non-cohort based (PACE).
29. Urban Residence: For the purposes of this study, urban residence will be defined as the Office of Management and the Budget defines Metropolitan Statistical

Areas (MSAs): a geographic cluster of no less than 50,000 people or an urban area of no less than 100,000 people and the counties that include these areas. Urban residence areas (MSAs) are "geographic areas consisting of a large population nucleus, and economically and socially related adjacent communities. Remaining areas are categorized as non-metropolitan" (as cited in Morrissey, 1987).

Summary

This chapter provided the background for this inquiry into the relationship between demographic and educational variables (as measured by the Demographic and Educational Questionnaire), learner epistemological beliefs (as measured by Schommer's Epistemological Questionnaire), and learner perception of self-directed readiness (as measured by the Self-directed Learning Readiness Scale). Research has confirmed that participation in formal adult education has increased over the past three decades. Currently those 25 and older "constitute the largest and most rapidly growing education sector in the nation" (Kegan, 1994, p. 271). A simultaneous trend is the workplace need for college graduates who are "constant, active, and adaptive learners" (Spence, 2001, p. 18).

In his 1994 work, *In Over Our Heads*, Kegan pointed to ways in which universities can respond to the needs of both students and prospective employers. The critical goal of adult education, Kegan argued, is to develop curriculum that educates students in such a way that they become mentally capable of self-direction. A means to accomplish this goal is not increased specialized training but instead a strong foundation

in the liberal arts to develop the skills needed for self-direction, self-authorship, and epistemic sophistication.

In a university setting, adult students are often expected to participate in self-directed learning projects and to engage in experiential learning activities. Currently, many students come to universities unprepared to accomplish these tasks. It is important to ask questions about how universities can best prepare students to meet the demands required of them in an educational setting and in their lives beyond college. Despite the vast research base, very few studies have explored the relationship between demographic variables, educational variables, learner epistemological beliefs, and learner perception of self-directed learning readiness.

The findings from this study contribute to understanding and quantifying the relationship between demographic and educational variables, epistemological beliefs, and learner perception of self-directedness. Educators, policy makers, and researchers can use the findings from this study to further develop theory and practice. The significant variables identified in this study contribute to the development of an abbreviated instrument that will allow universities with similar populations to adequately place students and to develop curriculums that promote learner self-directedness and epistemic growth. Universities with similar adult populations can use the findings from this study in conjunction with an abbreviated instrument to make informed decisions about curriculum and course development. A review of the related literature follows in Chapter 2.

CHAPTER 2

Introduction

This chapter includes a review of literature on the study of self-directed learning, cognitive and moral development, and epistemological beliefs. The literature from these areas provided a foundation for the research questions for this study exploring the relationship between demographic and educational variables, learner epistemological beliefs, and learner self-directedness.

Review of Related Literature

A review of related literature served as a foundation for developing this study. The literature review, as Best and Kahn (2003) pointed out, has helped to "sharpen and define understanding of existing knowledge in the problem area" (p. 36), as well as to provide some background information on the topic and to familiarize the reader with the theoretical underpinnings of the research questions.

The Study of Self-Directed Learning

Self-directed learning is an important aspect of adult education. According to Merriam and Caffarella (1999), it is the most common form of adult learning. Many researchers (Cross 1981; Houle, 1993; Long & Morris, 1996; Tough, 1973) have estimated that upwards of 70% of adults participate in self-directed learning projects. In fact, Cross (1981) referred to self-directed learning as "almost universal." Brockett and Hiemstra (1991) pointed out that the idea of self-directed learning has existed from antiquity to the present under the guise of numerous names. Specifically, these authors have traced self-directedness from Socrates, to Benjamin Franklin, to contemporary

American society through the notion that the primary goal of a person's education should be to develop into an adult self-learner (pp. 7-9).

The empirical and philosophical research on self-directed learning can be grouped into six major categories of inquiry:

1. the philosophical nature of the process of self-directed learning and verification studies;
2. self-directed learning as a personal trait or a process, including models of self-directed learning;
3. readiness for self-directed learning;
4. policy questions pertaining to the adult educator, institutions, and society;
5. the role of critical reflection in self-directed learning; and
6. meta-analysis of the research and suggestions for further studies.

Each of these categories is reviewed in the following sections.

The Philosophical Nature of the Process of Self-Directed Learning and Verification Studies

Tough (1971, 1973) provided the first comprehensive studies of self-directed learning. Building on the work of Houle (1961) and others in *Adult Learning Projects* (1971), Tough coined the term self-planned learning. Tough's term later became known as self-directed learning. Tough described self-directed learning as "a series of related episodes, adding up to at least seven hours" (1973, p. 6) where "more than half of the person's total motivation is to gain and retain certain fairly clear knowledge and skill, or to produce some other lasting change in himself" (1971, p. 7). An episode was defined as a "period of time devoted to a cluster or sequence . . . of related activities, which are not

interrupted much by other activities" (1971, p. 7). According to Tough's definition, a learning project must be at least the length of a typical working day, a minimum of 7 hours, and must take place within a six month time frame. Tough discovered in his research that the range in time spent on learning projects was from a high of 2000 hours to less than 100 hours.

Tough's (1971, 1973) initial studies included subjects from seven distinct populations, including blue-collar workers, women in lower-level white collar positions, men in lower-level white collar positions, beginning elementary school teachers, municipal workers, social science professors, and upper-middle class women with pre-school children. He found that adults take on as many as 15 or 20 projects per year, with a median of 8.3.

Tough also investigated the motivation behind self-directed learning projects. He found that adults learn in order to maintain a job or to enhance job skills, to develop personally, to carry-out responsibilities in the home, to nurture one's natural curiosity or interest, or to pursue a hobby or leisure activity. In an exploration of the benefits of self-directed learning, Tough found that those who participate in self-directed learning projects enjoy a sense of autonomy, positive self-feelings, and increased confidence.

At approximately the same time as Tough's work, the idea of learner self-directedness began to permeate the field of adult education. Malcolm Knowles, often referred to as the father of andragogy, wrote extensively on this topic. Andragogy has been described as a theory (Knowles, 1986), and it has been most often thought of as "a set of assumptions and methods pertaining to the process of helping adults learn" (Darkenwald & Merriam, 1982, p.14). Adult students have been generally believed to be

autonomous, active, objective, focused, creative, and broadly interested (Leith, 1997). Knowles' (1970) assumptions underlying andragogy included:

1. Adult self-concept moves from one of being a dependent personality toward one of being a self-directing human being.
2. Adults accumulate a growing reservoir of experience that becomes an increasing resource for learning.
3. Readiness to learn becomes oriented increasingly to the developmental tasks of an adult's social roles.
4. Adult's changing perception of time causes a shift in emphasis from one of postponed application of knowledge to immediacy of application and from subject-centered to one of problem-centeredness (p. 39).

Knowles concluded that since adults are in a distinct developmental stage, as learners they have different needs than children, adolescents, and young adults.

Self-Directed Learning as a Personal Trait or as a Process and Models of Self-Directed Learning

In the literature on self-directed learning that followed Tough and Knowles, some authors focused on self-directed learning as a process while others examined the personal characteristics of the self-directed learners. Candy (1988, 1991) pointed out that in the research to this point, self-directed learning had been used to describe both a process and personal characteristics of adult learners. Candy (1988, 1991) outlined the various dimensions of the self-directed learning process from the previous literature. Candy concluded that self-directed learning referred to:

1. a personal quality or attribute (personal autonomy),

2. the independent pursuit of learning outside of an institutional setting (autodidaxy),
3. a way of organizing instruction in formal settings (learner-control), and
4. the willingness and ability to conduct one's own education (self-management) (1991, p. 23).

Candy found that self-directed learning generally does not exist in a "pure" form but mostly as a "matter of degree." He also argued that the self-directed process is serendipitous and non-linear.

Because of the confusion in the literature about the term self-directed learning and the propensity to confuse the characteristics of self-directed learners and the process of self-directed learning, Brockett and Hiemstra (1991) advocated the use of the term *self-direction in learning* because it refers "both to the external characteristics of an instructional process and to internal characteristics of the learner" (p. 24, emphasis in the original).

Self-Directed Learning as a Personal Trait

Much of the research that characterizes self-directedness as a personal trait can be traced back to Malcolm Knowles (1980). In Knowles' (1980) work, one of the four assumptions underlying andragogy was that "adults have a deep psychological need to be generally self-directing" (p. 43). This ideology was the basis for the belief that adult learners are in a distinct developmental stage, and they have needs that are different than those of other learners. According to many researchers in the field of adult education, adults have a self-concept of being responsible for their own lives, they are autonomous, and they have a psychological and social need to be treaded as being capable of self-

direction (Brockett & Hiemstra, 1991; Candy, 1991; Knowles, 1980; Merriam & Brockett, 1997).

Brockett and Hiemstra (1991) viewed self-direction in learning as both a process and as a set of personal characteristics or attributes of a learner. In their Personal Responsibility Orientation Model (PRO) of self-directed learning, the researchers discussed at length the learner's ability to take responsibility for his/her own learning. Brockett and Hiemstra (1991) wrote that "only by accepting responsibility for one's own learning is it possible to take a proactive approach to the learning process" (p. 27). In addition to considering individual learning preferences, ownership, and responsibility, Brockett and Hiemstra discussed the social context in which the learning takes place as important to the process. Brockett and Hiemstra further pointed out the connection in the research base between learner self-direction and positive self-concept.

Other researchers correlated learning style and self-directedness. Unfortunately, these findings about personal characteristics and traits are often, at best, contradictory and, at worst, inconclusive. Deroos's (1982) study of 174 adults enrolled in a three year independent study program for hospital administrators found that an abstract learning style was positively correlated with individual performance in self-directed learning. In another study, Theil (1984), found that intuitive and active learners, grouped as the accommodator style, were successful in self-directed learning. In a contradictory finding, Adenuga (1991) reported that a balanced preference for active and abstract learning styles among the 178 graduate students in the study increased learners' success in self-directedness.

In more studies linking learning style and self-directedness, there were also contradictory findings. Pratt (1984) found that individuals with a field independent learning style were more capable of self-direction than those with a field dependent learning style. This research was directly contradicted by a later study by Brookfield (1986) where the role of critical self-reflection was stressed. Brookfield (1980, 1981, 1982) and Theil (1984) found that successful self-directed learners exhibited qualities similar to those of field-dependent learners, including utilizing others as a resource to provide information, to serve as a model, and to reinforce learning. Brookfield (1986) claimed that in order to be self-directed, individuals needed to have a high degree of field dependence in order to see knowledge as contextual and relative. In Brookfield's view, critical self-reflection was central to the self-directed process, and this kind of world-view was most often seen in field-dependent learners.

A strand in the self-directed learning literature has dealt with learner autonomy as a personal characteristic. Chene (1983) claimed that there are three principle characteristics that define an autonomous learner. An autonomous learner is independent, has good judgment and the ability to make important choices, and has the ability to "articulate the norms and limits of a learning society" (as cited in Merriam & Caffarella, 1999, p. 309). Candy (1991) expanded on Chene's definition of the autonomous learner by adding the element of personal values and beliefs. Candy posited the notion that these values and beliefs give learners "a solid foundation for conceiving goals and plans, exercising free choice, using rational reflection, having the willpower to follow through, and exercising self-restraint and self-discipline" (as cited in Merriam & Caffarella, 1999,

p. 309). Based on a review of literature on self-directed learning, Candy identified characteristics of successful self-directed learners. These included:

- methodical/disciplined,
- logical/analytical,
- reflective/self-aware,
- curious/open/motivated,
- flexible,
- interdependent/interpersonally competent,
- persistent/responsible,
- venturesome/creative,
- confident/having a positive self-concept,
- independent/self-sufficient, and
- having knowledge about and skilled with learning processes, and
- having the ability to develop and use criteria for evaluating learning (as cited in Rager, 2000, p. 19).

As indicated in the proceeding section, the characteristics of self-directed learners have been defined in many ways: as a developmental stage (Knowles, 1980), as a combination of learning preferences, ownership, and responsibility (Brockett & Hiemstra, 1991), as related to learning style (Adenuga, 1991; Brookfield, 1986; Deroos, 1982; Pratt, 1984; Theil 1984), and as a combination of planning, making choices, exercising good judgment, reflecting, and exercising willpower and self-discipline (Candy, 1991; Chene, 1983). Many of these characteristics were measured by the Self-Directed Learning Readiness Scale (SDLRS) developed in the doctoral dissertation of Guglielmino in 1977.

Guglielmino (1977) defined learner self-directedness as comprised of the beliefs, values, attitudes, and attributes of learners. A more detailed discussion of the SDRLS follows in the section concerning readiness for self-directed learning.

Models of the Process of Self-Directed Learning

In addition to research into the personal characteristics of self-directed learners, another strand of research has focused on the process of self-directed learning. Within the literature describing self-directed learning as a process, researchers produced three types of models: linear, interactive, and instructional.

The early models proposed by Tough (1971) and Knowles (1975) were linear in nature. Tough (1967, 1971, 1979) found learners used thirteen steps in self-planned learning projects including:

1. deciding what detailed knowledge and skill to learn;
2. deciding the specific activities, methods, resources, or equipment for learning;
3. deciding where to learn;
4. setting specific deadlines or intermediate targets;
5. deciding when to begin a learning episode;
6. deciding the pace at which to proceed during a learning episode;
7. estimating the current level of his knowledge and skill or his progress in gaining the desired knowledge and skill;
8. detecting any factor that has been hindering learning or discovering inefficient aspects of the current procedures;
9. obtaining the desired resources or equipment for reaching the desired place or resource;

10. preparing or adapting a room (or certain resources, furniture or equipment) for learning or arranging certain other physical conditions in preparation for learning;
11. saving or obtaining the money necessary for the use of certain human or nonhuman resources;
12. finding time for learning; and
13. taking steps to increase the motivation for certain learning episodes. (Tough, 1971, pp. 94-95, as cited in Merriam & Caffarella, 1999, p. 294)

Tough's early research became the foundation for numerous studies on self-directed learning. These investigations included studies of distinct populations such as pharmacists (Johns, 1973), urban and rural samples (Peters & Gordon, 1974), extension agents (Bejot, 1981), nurses (Kathrein, 1981), farmers (Bayha, 1983), students at all levels (Geisler, 1984; Kratz, 1978), older adults (Hiemstra, 1976), clergy (Morris, 1977), and physicians (Richards, 1986) (as cited in Merriam & Caffarella, 1999, p. 294-295). There are more than 15 doctoral dissertations and 12 items in the ERIC database that build on Tough's work. The most comprehensive study to date is Penland's (1977)--a national (United States) study of self-planned learning.

Knowles' (1975) model is similar to that proposed by Tough (1979). Knowles' model, however, only included six steps:

1. setting the climate for self-directed learning,
2. diagnosing the needs of the learner,
3. setting goals for the learning project,
4. identifying material and human resources for the project,
5. selecting appropriate learning strategies, and

6. evaluating the learning project.

Knowles' model focused extensively on the resources a learner needs in order to complete a learning project. Specifically, Knowles discussed learning contracts and evaluation as integral to the self-directed learning process. The early work of Tough and Knowles provided a description of what happens during the process of self-directed learning and outlined the essential steps in the process.

A second set of models of self-directed learning deviated from these early works and were interactive in nature. These models focused on serendipitous factors, such as opportunities, environmental factors, personal traits, cognitive process, and cultural context. Additionally, interactive models took into account how these factors may interact during the self-directed learning process. Spear's (1988) model focused on three major elements:

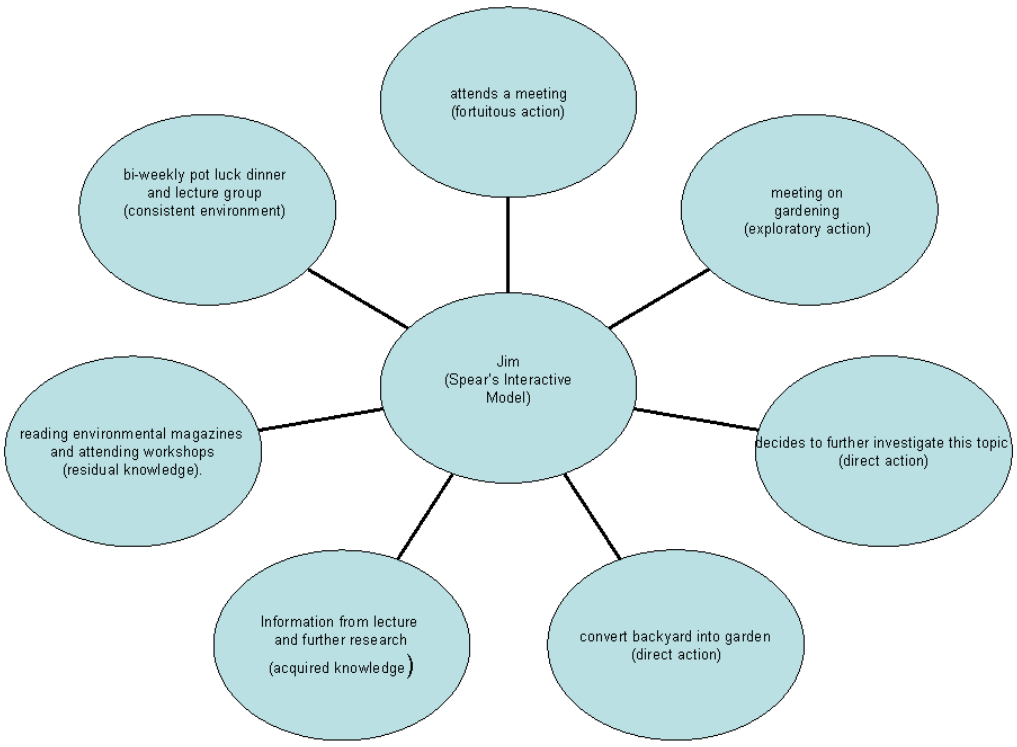
1. the environmental opportunities of the learner,
2. the present or past knowledge of the learner, and
3. the action of the learner.

Spear found that these major elements of self-directed learning could be described in seven components. The environmental components included a consistent environment in which human and material resources are regularly in place and readily available. Also, the environment needed to include an opportunity for chance encounters that affected the learner and the project. The knowledge of the learners included both residual knowledge the learner brings to the project and the acquired knowledge that the learner procures as part of the project. Finally, the elements of the action of the learner included directed action, exploratory action, and fortuitous action. Directed action was movement toward a

deliberate and specified end while exploratory action empowered the learner to make choices without knowing for certain what the end result would entail. Action that the learner takes for reasons not directly related to the learning project was what Spear dubbed fortuitous action (Spear, 1988, pp. 212-213).

Spear claimed that each self-directed learning project was composed of sets or clusters of the seven components mentioned above. Spear concluded that self-directed learning projects do not generally occur in a linear fashion; one cluster does not necessarily bear any relation to the next cluster. For example, as depicted in the model shown in Figure 1, one learner, Jim, may be involved in a bi-weekly pot luck dinner and lecture group (consistent environment).

Figure 1
Spear's Interactive Model of Self-Directed Learning



Jim has some free time, so attends a meeting (fortuitous action) which happens to be dedicated to organic gardening (exploratory action), a subject he has also become familiar with through reading environmental magazines and attending workshops (residual knowledge). He decides to further investigate this topic so that he can convert part of his backyard into an organic garden (direct action). He takes information from the lecture and further researches the topic (acquired knowledge).

In another interactive model of self-directed learning, Cavaliere (1992) focused on the process used by the Wright brothers as they constructed the first airplane. Cavaliere identified five stages of their learning project:

1. inquiring (the need to solve a problem),
2. modeling (observing phenomena and developing a theory and model),
3. experimenting and practicing (a continuous process of refining and revising the model),
4. theorizing and perfecting (fine-tuning the skills and the product), and
5. actualizing (being recognized for the product of their learning project).

Cavaliere's model incorporated the stages of the learning process and the cognitive processes used throughout the learning project.

Brockett and Hiemstra (1991) developed the Personal Responsibility Orientation (PRO) model of self-directed learning. The PRO model distinguished between "instructional method processes (self-direction in learning) and personal characteristics (learner self-direction)" (Brockett & Hiemstra, 1991, p. 26). In the first dimension of the model, the instructional processes dimension, learners assume responsibility for planning, implementing, and evaluating their learning experiences. It is the role of the instructor is

to facilitate this learning by assisting learners in assessing needs, locating resources, utilizing learning strategies, and evaluating the project. In the second dimension of the model, Brockett and Hiemstra focused on the learner's personal responsibility, including assuming personal responsibility for reaching his or her own potential. Brockett and Hiemstra (1991) pointed out that

> these two dimensions are linked through the recognition that each emphasizes the importance of learners assuming personal responsibility for their thoughts and actions. Finally the PRO model is designed to advance understanding of self-direction by recognizing the vital role played by the social context in which learning takes place. (p. 33)

Danis' (1992) model included a framework with five major components and extensive subcomponents based on a synthesis of the self-directed learning, self-instruction, and learning strategies literature. Because Danis' model was based on the previous literature, there were many components in Danis' model that had appeared in previous models. The major components included learning strategies (ways used to acquire or apply new knowledge), phases (the stages of learning activities), learning content (knowledge acquired by the learner), the learner (individual abilities, identity, cultural factors, and social factors for a learner or group of learners), and the context (external factors influencing the environment).

Garrison (1997) proposed an interactive and multidimensional model of self-directed learning. This model included self-management (contextual control), self-monitoring (cognitive responsibility), and motivation (influencing factors). The self-management piece of this model focused on the learner's need to take control of the

learning environment in order to meet the goals of the learning project. Like Brockett and Hiemstra (1991), Garrison focused on increased learner responsibility. The self-monitoring aspect of Garrison's model focused on the learner's ability to monitor his/her learning strategies and metacognitive process. In the third dimension of the model, motivation, Garrison outlined what events, feelings, and circumstances prompted learners to participate in self-directed activities.

Instructional models of self-directed learning outlined practices in formal settings that could be used to implement self-directed learning into the curriculum. Grow's (1991) instructional model had four stages of how teachers can assist students to become more self-directed in their learning. During stage 1, learners need more teacher-direction because learners with low self-direction require direction by an authority figure. In the second stage of moderate self-direction, learners may be motivated but still require significant learner direction because they do not yet have a grasp of the subject matter at hand. During the third stage, learners with intermediate self-directed abilities need less teacher direction as they understand the subject and view themselves as being capable and ready to explore the material with some assistance from a knowledgeable guide. During the last stage, learners who are highly self-directed need little help from an expert because they are willing and able to plan, complete, and evaluate their own learning projects. Grow's model emphasized that good teachers individualize their instructional strategies to the various levels of their students and match the learner's level of self-direction with the self-directed learning strategy implemented.

The model of self-directed learning proposed by Hammond and Collins (1991) included the examination of social, political, and environmental contexts that affect learning. The seven point model included:

1. building cooperative learning climates,
2. asking students to analyze and reflect on their social, economic, and political contexts,
3. having students develop competency profiles for themselves,
4. diagnosing learning needs within both personal and social contexts,
5. forming personal and social learning goals,
6. implementing and managing the learning process, and
7. reflecting critically on the learning project.

These seven points encourage students to situate their learning within political, social, economic, and personal contexts, at once focusing on the internal and external implications of their learning. This model also encourages students to act on their reflections. This kind of reflection is consistent with liberatory pedagogy and offers a unique emphasis on emancipatory learning and social action.

There are three types of models of self-directed learning outlined in this chapter: linear, interactive, and instructional models. The early models of self-directed learning put forth by Tough (1971) and Knowles (1975) described self-directed learning as a linear set of steps learners progress through as they complete their learning projects. Interactive models, like those proposed by Spear (1988), Cavaliere (1992), Brockett and Hiemstra (1991), Danis (1992), and Garrison (1997), depicted self-directed learning as a fluid and often serendipitous process comprised of internal factors, such as motivation,

learning style, and personal responsibility, and external factors, such as environmental opportunities, the need to solve a problem, and the social situation. The instructional models of Grow (1991) and Hammond and Collins (1991) included classroom management techniques to individualize instruction and suggestions for incorporating self-directed learning appropriately in various social, political, and environmental contexts.

Readiness for Self-Directed Learning

A strand of the self-directed learning research focused on the role of the learner's readiness for self-directed learning. Guglielmino (1977) defined self-directed learning readiness as "a complex of attitudes, values, and abilities that create the likelihood that an individual is capable of self-directed learning" (as cited in Merriam & Caffarella, 1999, p. 307). Guglielmino identified the qualities that influence readiness for self-directed learning. These included:

- independence,
- imagination,
- persistence,
- acceptance of responsibility for one's own learning,
- discipline,
- curiosity,
- ability to learn independently,
- love of learning,
- goal-orientation, and
- problem solving.

These qualities were the basis for the Self-Directed Learning Readiness Scale (SDLRS) developed in 1977 to help individuals assess their skills and attitudes in regard to self-directedness.

The instrument was designed using a panel of 14 experts in self-directed learning in a three-round Delphi survey process. The SDLRS was administered to 307 people in Georgia, Vermont, and Canada. From this administration, additional revisions were made and a reliability coefficient of 0.87 was obtained (Brockett & Hiemstra, 1991, p. 56). The SDLRS contained 58 items. Each item was scored on a 5-point Likert scale yielding a total score for the learner's perception of his or her self-directedness.

A factor analysis of the instrument by Guglielmino (1977) identified the following eight factors:

1. openness to learning opportunities,
2. self-concept as an effective, independent learner,
3. initiative and independence in learning,
4. informed acceptance of responsibility for one's own learning,
5. love of learning,
6. creativity,
7. positive orientation to the future, and
8. ability to use basic study skills and problem-solving skills

In practice, the SDLRS has been utilized as a diagnostic tool for assessing learners' perceptions of their readiness for self-directed learning. In research settings, the SDLRS has been utilized to explore the relationships between self-directedness and other

personal variables through experimental, quasi-experimental, and correlational research designs.

In numerous studies researchers have found that a relationship exists between learner's perceptions of their self-directed readiness and other variables. Torrance and Mourad (1978) found correlations between learner perception of self-directed readiness and three measures of originality. The researchers also found learner's perception of self-directedness related to the ability to develop analogies, the ability to think creatively, and the right hemisphere style of learning. They found a negative correlation with left hemisphere style of learning. In another study, Sabbaghian (1979) examined the relationship of self-concept relative to self-directedness. The five major findings of this study were:

1. a significant positive correlation between self-directed readiness and self-concept;
2. a positive relationship between self-concept and all factors of the SDLRS except "acceptance of responsibility for one's own learning";
3. a positive relationship between self-image and self-directed readiness;
4. a positive relationship between years of formal education and four of the eight factors (individuals with more education scored higher on love of learning, creativity, initiative in learning, and self-understanding); and
5. a positive relationship between class rank and SDLRS scores.

Sabbaghian (1979) concluded that students with higher self-concepts appeared to be "more likely to be able to plan and direct the majority of their learning projects themselves than adult students with lower self-concepts" (pp. 114-115).

Skaggs' (1981) dissertation was a study of a group of nurses in Texas. In this study, the SDLRS was administered with three other instruments including a biographical data form, a measure of locus of control, and a survey designed to assess self-directed learning involvement. Skaggs found positive relationships between SDLRS scores and the number of hours devoted to self-directed learning and the locus of control. Skaggs found a negative relationship between learner perception of self-directed learning readiness and the influence of powerful others, such as doctors and supervisors.

In other dissertations, Hassan (1981) found a significant positive correlation between the number of learning projects and the total SDLRS score on seven of eight of the factors scores on the instrument, and Hall-Johnson (1985) found evidence for the link between learner self-directedness and the learning environment. Hall-Johnson found "a positive, predictive relationship between readiness and the number of self-planned projects conducted, as well as the amount of time spent on them" (p. 2522A).

Brockett (1983) administered the SDLRS and the Salamon-Conte Life Satisfaction in the Elderly Scale to 64 persons age 60 and older. Brockett found a positive relationship between self-directedness, independence, and quality of life. In another study of those 60 and older, East (1986) surveyed 103 adults in a central Florida retirement village. East found that "acceptance of responsibility for one's own learning" and "love of learning" were "mostly responsible for the effect on life satisfaction" (p. 2848A).

Leeb (1983) explored the relationship between self-directed readiness and the tendency to practice a healthy lifestyle. In her sample of 45 adults between the ages of 21 and 55, she found that "the people who demonstrate positive health behaviors can be described as highly self-directed" (p. 159). Leeb built on the work of cognitive and

ethical development as proposed by Perry (1970). Leeb's hypothesis was that as individuals moved away from dualist thinking, there would be an increase in learner perception of self-direction. This hypothesis was not confirmed, but Leeb suggested that the hypothesis should not be abandoned due to the small size of her sample and the exploratory nature of her initial investigation.

In another study of 136 college students, Long and Agyekum (1988) concluded that their study offered validation support for the SDLRS. These researchers compared the SDLRS scores with the age, educational achievement, dogmatism, instructor ratings of the students, and agreement response set of the participants. The agreement response set measured the extent to which a subject's responses were earnest answers informed by personal beliefs and knowledge or were responses governed by a tendency to answer consistently regardless of the content of the items on a scale. The findings included:

1. a positive correlation between increasing age and higher SDLRS scores;
2. overall, black students scored significantly higher on the SDLRS than white students;
3. a negative correlation between those who scored higher on the SDLRS and their scores on dogmatism and the agreement response set;
4. no significant relationship between instructor ratings and SDLRS scores; and
5. instructors rated white students significantly higher on self-directed learning than black students (as cited in Brockett & Hiemstra, 1991, p. 62).

The finding on race in this study was an important one, given the notion asserted in the literature that self-directed learning is often described as a primarily white, middle-class

phenomenon (Brookfield 1984, 1985b, 1988) and that the empirical research on self-directed learning has focused primarily on highly-educated, white subjects.

In a follow-up study, Long and Agyekum (1988) found consistency with the original study in all areas except in regard to instructor ratings. The correlation between the SDLRS scores and the teacher rating of self-directedness was higher than in the first study, but not to the extent that the finding was statistically significant. This dramatic change prompted the authors to suggest that the teacher-rating instrument utilized in the first study was flawed.

Another correlational study focused on the desire to learn for the pure enjoyment of learning and on learner self-directedness. In Reynolds' (1985) study of 95 part-time community college students, participants were given the SDLRS and the Education Participation Scale (Boshier, 1971). Reynolds found a significant positive correlation between the SDLRS total scores and the motivational orientation factor cognitive interest, and a negative correlation was found between readiness for self-direction and the motivational orientations of professional advancement and external expectations (as cited in Brockett & Hiemstra, 1991, p. 63). Based on these findings, Reynolds (1985) suggested that those who were internally motivated by the desire to learn and enjoy learning were more likely to perceive themselves as self-directed while those who were motivated by external factors, such as professional advancement and the expectations of others, were less likely to perceive themselves as ready for self-directed learning.

In another study, McCarthy (1985) used the SDLRS to examine the relationships between SDLRS scores and attitude toward mathematics among 183 undergraduate students aged 25 and younger and older students aged 26 and older. There was no

significant relationship found between learner self-directedness and attitude toward mathematics. However, the older group was found to be significantly more self-directed than the younger group.

Guglielmino and Guglielmino (1983) studied the link between the characteristics of creativity, problem-solving ability, and degree of personal change and job performance. The sample consisted of 753 employees of a large utility company participating in training courses. The sample included both managers and non-managers. Those individuals rated as outstanding performers in jobs requiring high levels of creativity, problem-solving, and ability to adapt scored significantly higher than those of the other groups. Additionally, a positive relationship was found between SDLRS scores and level of education. Women scored slightly higher than men, and there were no significant differences between racial groups or between managers and non-managers (as cited in Brockett & Hiemstra, 1991, pp. 63-64).

The SDLRS has been used in several other studies correlating SDLRS scores and a number of assorted variables. In Young's (1986) study, there was no significant correlation between self-directed learning readiness and locus of control. In another study, Johnson, Sample, and Jones (1988) found that self-directed readiness was related to the "intuitive" approach and "judging" orientation of the Myers-Briggs Type Indicator. Russell (1988) found that learner perception of self-directed readiness was negatively related to a preference for structure in a course setting although the score was not related to achievement. Bitterman (1989) found a relationship between learner perception of self-directed readiness and achieving style, a concept that "is based on motivation theory and

is rooted in the individual's reinforcement for goal accomplishment" within one's environment (p. 851A).

In a study of learner perception of self-directed readiness among three populations affiliated with the Southern Baptist Seminary, Cunningham (1988) found that there was a significant increase in readiness from new to graduating students. Cunningham concluded that after graduation and two years in the ministry, readiness for self-directed learning "did not significantly increase" (p. 3246A). Brockett and Hiemstra (1991) pointed out that the word "increase" in Cunningham's findings was misused; in fact, there was no significant difference between the graduating and the two year experience in the ministry groups (p. 66).

Rutland's (1987) study focused on the effects of group activities on Adult Basic Education (ABE) and General Education Development (GED) students' self-concept and self-directed readiness. Rutland used an experimental pre-test/post-test design, and the experimental control groups participated in 10 hour-long group sessions. Rutland found no significant differences between the experimental and control groups on either self-directed readiness or self-concept.

Savoie (1979) administered the SDLRS and a biographical information instrument to 152 nurses enrolled in one of seven nursing courses. Savoie found a positive relationship between SDLRS scores and course grades. Savoie also found a positive relationship between self-directed readiness as measured by the SDLRS and individuals' self-concept as self-directed learners, a finding validated by several later studies (Brockett, 1982, 1985; Sabbaghian, 1979). Savoie concluded that the SDLRS can

be useful in the determining the amount of assistance or support learners may need when engaged in activities requiring high-degrees of learner self-direction.

In another study of nurses, Box (1983) studied 477 first level students, second level students, and graduates of a two year nursing program. Box did not find significant differences in SDLRS scores among the three groups; however, she did find a significant correlation between SDLRS scores and grade point average. This validated Savoie's (1979) findings.

In Wiley's (1981, 1982) study of 104 junior nursing students aged 20-21, the experimental and control groups were given the SDLRS and a measure of preference for structure, Ginther's Reaction of Statements (Ginther, 1974). The experimental group participated in a 12-hour self-directed learning process. After the experimental treatment, each group was again administered the SDLRS. Wiley concluded that teaching the self-directed learning process did not increase the readiness of these undergraduate nursing students. Overall, the preference for structure did not affect the students' readiness, but students who preferred low structure and who were exposed to the experimental treatment increased their self-directed learning readiness scores. Wiley suggested that it is best practice to assist students in self-structuring if their preference is for high structure; likewise, it is best practice to provide a process experience for students who prefer low structure.

Crook (1985) investigated the predictive validity of the SDLRS. Crook drew on the earlier work of Savoie (1979). In this study, 63 first year students completed a demographic questionnaire and the SDLRS during the first week of classes. At the conclusion of the academic year, instructors and students nominated the three most

effective self-directed learners from each of the seven to eight member learning groups. Crook found significant correlations between SDLRS scores, nomination scores, and end of year grades. However, these scores only explained seven and eight percent (respectively) of the variance. Crook concluded that the SDLRS is not a valid instrument for the purposes or predicting success or failure in college (p. 278).

Other dissertations on self-directed learning in nurses include a correlational study linking home study course grades and SDLRS scores (Moore, 1988), a study outlining the effects of a clinical internship on learner self-directedness (Murray, 1987), and a study examining the effect of higher education on the self-directedness of nurses (Palumbo, 1990). Moore (1988) investigated the success of 121 nurses taking home study courses. In this study, the SDLRS scores did not correlate significantly with the final course grade. However, Moore advised that the sample was comprised of highly-motivated and highly self-directed technical and professional nurses who answered most test items correctly, and this could have limited the "possible correlation between the criterion and predictor variables" (p. 1670A). Murray (1987) studied the effect of a clinical internship on the self-directed readiness of undergraduate nursing students. Murray found that

1. the experimental group showed significant differences between pretest and posttest SDLRS scores;
2. there was a positive correlation between SDLRS scores, grade-point average, and plans for postgraduate education in nursing; and
3. the SDLRS scores were significantly higher for those students who felt that they had a quality internship experience.

Palumbo's (1990) 18 month study focused on a group of 45 registered nurses studying for an undergraduate degree. Palumbo concluded that the significant change in SDLRS scores of the group were correlated with participation in formal education and the readiness of the nurses to complete their programs of study.

In the professional nursing literature on self-directed learning, Graeve (1987) studied the patterns of self-directed learning for professional development. This study found that nurses reported:

1. spending significantly more time in self-directed rather than in teacher-directed activities; and
2. spending significantly more time in personal rather than in professional learning.

Graeve also found a significant relationship between SDLRS scores and the number of hours the learner spent engaged in self-directed learning activities, a finding that lends support to earlier studies (Hall-Johnson, 1985; Hassan, 1981). In another dissertation, Middlemiss (1987) investigated the relationship between SDLRS scores, job characteristics, motivating potential of a job, and job satisfaction in a sample of 115 nurses. Middlemiss found that the interaction of self-directed readiness, job characteristics, and motivating potential of the job "predicted 29 percent of the variance in job satisfaction for professional nurses" (p. 1036A).

This section included an overview of studies investigating the individual learner and readiness for self-directed learning. Guglielmino developed the SDLRS to measure learners' perceptions of their readiness to engage in self-directed activities. Numerous experimental, quasi-experimental, and correlational studies have been conducted using the SDLRS. Correlational studies using the SDLRS investigated the relationship between

learner perception of self-directedness and creativity, learning style, self-concept, locus of control, learning environment, life-satisfaction, healthy lifestyle, educational achievement, instructor ratings, cognitive interest, attitude toward mathematics, problem solving ability, and job performance. Additionally, many studies have been conducted with nurses and nursing students. Correlations were found between SDLRS scores and grade point average, preference for structure, the effects of a clinical internship, and participation in professional learning activities.

Policy Questions Pertaining to the Adult Educator, Institutions, and Society

Caffarella's (1982, 1983) studies examined self-directed learning in a graduate school setting. The participants in Caffarella's study were mailed copies of the SDLRS and the Learning Plan Format Follow-up Survey, an instrument developed by Caffarella to determine learners' opinions "related to the worth and value of the learning plan format, their perceptions of their own self-directed learning skills, and what if any effect this had on their own continuing learning and teaching activities" (Caffarella, 1982, p. 48). Of those surveyed, 69% believed the contracting format to be an excellent tool, while the remaining 31% rated this tool as "good" or "very good." The mean SDLRS scores of these participants were in the 90th percentile based on established norms by Guglielmino (1977). From this study, Caffarella concluded that utilizing learning contracts is a useful strategy to promote self-directed learning, and learning contracts can be employed in a wide variety of contexts within the field of adult education.

In an extensive follow-up study, Caffarella and Caffarella (1986) surveyed 163 students from 6 universities. The subjects were administered the SDLRS and two instruments developed by R.S. Caffarella, the Learning Contract Follow-Up Survey and

the Self-Directed Learning Competencies Self-Appraisal Form. In this study, the researchers found support for utilizing the learning contract in a graduate education setting. However, the use of a learning contract did not have a significant effect on the subjects' perception of their self-directed readiness as measured by the SDLRS. The researchers speculated that the very high pre-test scores on the SDLRS precluded a significant effect on the post-test scores.

In another study involving graduate students in adult education programs, Kasworm (1982, 1983) studied the development of self-directedness and self-directed behavior resulting from utilizing learning contracts in a graduate course. Kasworm administered the SDLRS at the onset and the completion of a Methods and Techniques in Adult Education course. The other instruments utilized in the study included a course evaluation form and an observational diary maintained by the instructor and two students during the course. The majority of the students in this study expressed positive reactions to the self-directed learning approaches and indicated a preference for future self-directed learning activities, while about one fourth of the students surveyed indicated they probably would not opt for additional coursework that utilized the self-directed learning approach. Kasworm suggested that some areas for further investigation to understand these two opposed preferences could include research into the link between self-directed readiness and writing and communication skills, cognitive ability, and learning-style preferences.

The Role of Critical Reflection in Self-Directed Learning

Another theme in the self-directed learning literature focused on the role of critical self-reflection in self-directed learning. Brookfield (1985a) argued that self-

directed learning does not occur in isolation and that others are essential in the process of critical self-reflection. Brookfield pointed out, “The learning activities of successful self-directed learners are placed within a social context and other people are cited as the most important learning resource” (p. 9). Brookfield also believed that peers and fellow learners serve as models, reinforce skills, provide additional information, counsel peers in times of crisis, and help strengthen the learning that occurs. Brookfield continued,

> When the techniques of self-directed learning are allied with the adult’s quest for critical reflection and the creating of personal meaning after due consideration of a full range of alternative value frameworks and action possibilities, then the most complete form of self-directed learning is exemplified. This most fully adult form of self-directed learning is one in which critical reflection on the contextual and contingent aspects of reality, the exploration of alternative perspectives and meaning systems, and the alteration of personal and social circumstances are all present. (Brookfield, 1985a, p. 15)

Guglielmino (1992) confirmed Brookfield’s (1985b) assertions and built on them as they pertained to an institutional setting. Guglielmino claimed that Brookfield promoted empowerment and self-direction in learners (Guglielmino, 1992, p. 112). Guglielmino (1992) found that not all adults will be equally prepared for self-directed learning, and that some institutional factors include:

1. some instructors will have difficulty in facilitating self-directed learning in an institutional context;
2. certain policies, curricular requirements, and traditional didactic concepts will make self-directed learning difficult in an institutional context; and

3. many facilitators and learners need training for self-directed learning formats. (Guglielmino, 1992, pp. 116-7)

Guglielmino, like Brookfield, suggested that it is the facilitator's responsibility to encourage critical reflection and present alternative viewpoints (Guglielmino, 1992, p. 119).

Meta-Analysis of the Research and Suggestions for Further Studies

The last theme in the self-directed learning literature was suggestions for future research. Experts in the field, such as Brockett, called for a fresh perspective on the future of self-directed learning. Some of the suggestions were:

1. develop new ways to measure self-directedness because the SDLRS is out of date (Brockett, 2000);
2. conduct more research that explores self-directed learning from a naturalistic perspective (Brockett, 2000);
3. explore questions about the limits of self-direction in an institutional setting; investigate how self-direction interfaces with issues of power and conflict in various practice settings (Brockett, 2000); develop categories of self-directed learning (Caffarella & O'Donnell, 1987); study teacher influence on self-directed learning (Caffarella & O'Donnell, 1987); explore institutional policy issues related to self-directed learning (Caffarella & O'Donnell, 1987);
4. define what constitutes a quality self-directed learning experience and how learners judge the quality of self-directed learning activities (Caffarella & O'Donnell, 1991); discuss the effectiveness of the use of learning contracts with

all levels of adult students ranging from high-school graduates to graduate students (Caffarella & O'Donnell, 1987; Kasworm, 1992);

5. explore the role of group/peer learning on learner self direction (Caffarella & O'Donnell, 1991; Guglielmino, 1992); and
6. deal with the innate worth and value of individual learning activities (Brookfield, 1984, p. 13; Brookfield, 1985b).

In this section, the development of the knowledge-base on self-directed learning was traced from the early work of Tough (1967, 1971, 1973, 1979) and Knowles (1970, 1975, 1980, 1986) to the present day. The major categories of philosophical and empirical research on self-directed learning were reviewed, including models of self-directed learning, studies about the individual learner and readiness for self-directed learning, policy questions pertaining to self-directed learning, the role of critical reflection in the self-directed learning process, and suggestions for further study.

The Study of Cognitive and Moral Development

Developmental theorists such as Piaget (1967), Kohlberg (1984), Baxter Magolda (1992), King and Kitchener (1994), Kasworm (1997), and Kegan (1994) have outlined stages of cognitive and moral development and developmental perspectives. These theorists have contended that a person's developmental stage and perspective affects how the individual actively constructs his/her own sense of reality. The theories range in developmental processes from childhood to adulthood, and these theories have been widely applied to the process of teaching and learning.

Piaget's Genetic Epistemology

Piaget called his theoretical framework "genetic epistemology," as he was most interested in how knowledge developed in the human organism. Central to Piaget's theory is the concept of cognitive structure. Kearsley (2004) described Piaget's cognitive structures as "patterns of physical or mental action that underlie specific acts of intelligence and correspond to stages of child development" (para. 2). According to Piaget, there are four primary cognitive structures (developmental stages): sensorimotor, preoperations, concrete operations, and formal operations. During the sensorimotor stage (0-2 years), intelligence is expressed through motor actions. The preoperations period (3-7 years) is intuitive in nature. The concrete operational stage (8-11 years) is characterized by logical thinking that depends on concrete referents. The formal operations stage (12-15 years) involves the ability to think abstractly. Piaget theorized that cognitive structures adapt through assimilation (interpreting events through the existing cognitive structure) and accommodation (changing the cognitive structure to make sense of the events). Piaget contended that cognitive development persists because of a constant effort to adapt to the environment in terms of assimilation and accommodation.

Kohlberg's Theory of Moral Development

Kohlberg (1984) applied the developmental approach of Piaget to moral reasoning. Kohlberg's theory included six stages of moral development that are divided into three levels. The first level, preconventional/premoral, is characterized by the child placing value on external events based on pleasant or unpleasant consequences. During level two, conventional/role conformity, moral values are based on meeting the expectations of others, maintaining order, and performing according to set roles and

standards. Level 3, postconventional/self-accepted moral principles, is characterized by the belief in shared standards, rights, or duties separate from supporting authority. The person conforms to internal standards, and decisions are based on thought and judgment concerning what is right and wrong (Driesen, 2005).

Baxter Magolda's Longitudinal Study of Development

In contrast to the work of Piaget and Kohlberg, Baxter Magolda (1992) focused exclusively on the epistemological beliefs of college students. Baxter Magolda's (1992) work focused on changes in students' construction of meaning as they moved from absolute truth, through contextual knowing, and toward independent knowing. The findings of Baxter Magolda's longitudinal study suggested that 68% of college students were in a state of absolute knowing when they entered the university. These students considered their role as learners to obtain knowledge from the instructors. The remaining 32% of students entering college were in a stage of transitional knowing. These students considered knowledge to be partially certain and partially uncertain. They viewed their role as learners as understanding knowledge. In both stages, the students saw themselves as passive recipients of knowledge passed down from an authority figure, the professor. During their final year of college, 16% of these students progressed to independent knowing. During this stage, the students considered knowledge to be uncertain; and they expected everyone to think for themselves and create their own perspective based on learning and reflection. During the year following graduation, independent knowing increased to 57% of the sample. A discussion of Baxter Magolda's research on gender and the researcher's longitudinal studies follows in the section on personal epistemology.

King and Kitchener's Model of Cognitive Processing

The work of King and Kitchener (1994) also focused on older adolescents and adults. King and Kitchener proposed a three-level model of cognitive processing. The model was based on how individuals faced ill-structured problems. In King and Kitchener's (1994) model, when individuals do not believe that knowledge is uncertain and do not use reasoning and evidence, then they are in a stage of prereflective thinking. The next stage, quasi-reflective thinking, is characterized by individuals that recognize some uncertainty but have a difficult time justifying their conclusions. The last stage, reflective thinking, is characterized by individuals who recognize that knowledge is actively constructed and must be understood contextually. Reflective thinkers believe that judgments must be grounded in evidence and conclusions must remain open to reevaluation. A discussion of King and Kitchner's contributions to the study of personal epistemology follows in the section devoted to this topic.

Kasworm's Five Perspectives

The work of Kasworm (1994) focused on adult learners. Kasworm has suggested that sources of authority and sources of knowledge affect the levels of engagement or of disengagement of adults in learning situations (Kasworm, 1997; Kasworm & Blowers, 1994). Kasworm (1997) characterized various perspectives on knowledge and authority as knowledge voices. Kasworm, Polson, and Fishback (2002) pointed out that "although intellect and cognitive complexity do influence each adult learner's engagement in learning, these knowledge voices reflect the *stance* of the adult learner in relation to learning and are not necessarily influenced by the level of cognitive knowledge or reflective judgment" (p. 93, emphasis in the original). These voices do not necessarily

represent a developmental stage, but they are helpful in thinking about the cognitive and epistemological perspectives of adult learners.

Kasworm classified these knowledge voices as entry voice, outside voice, cynical voice, straddling voice, and inclusion voice. Entry voice adult students are those who are new to college and whose primary aspiration is to succeed in an academic environment, despite not being able to make any personal meaning out of the classroom content. The outside voice of the adult student comes from the student's affiliations outside of the educational setting. This voice values practical knowledge and values academic knowledge when it is congruent with current understandings. The cynical voice is composed of students who value education mostly for credentialing purposes. These students believe there is little value in formal education. The group labeled as straddling voice values both the academic world and learning they have experienced outside of the academic world. Students in this group strive to integrate information and understandings from one world with perspectives and insights from the other realm. The inclusion voice is composed of adults who are immersed in the academic world and who "perceive themselves as building bridges between their worlds outside the academy and within the academy" (Kasworm et al., 2002, p. 97).

Kegan's Theory of Meaning Making

Robert Kegan's (1982, 1994) theory of meaning-making was based on the work of Perry (1970), who claimed that the human organism organizes meaning. Kegan referred to this process as *meaning-making* (Ignelzi, 2000, p. 5, emphasis in the original). Kegan viewed "meaning-making as a process that continues to develop throughout one's life span" (Ignelzi, 2000, p. 6). According to Kegan (1982), an event does not have a

singular meaning that is imposed upon the individual experiencing that event. Rather, meaning is created in the zone of mediation between the event and the individual's reaction to it. The zone of mediation is "the place where the event is privately composed, made sense of, the place where it actually *becomes* an event for that person" (p. 2, emphasis in the original). Kegan (1982) argued:

> The activity of being a person is the activity of meaning-making. There is no feeling, no experience, no thought, no perception, independent of a meaning-making context in which it *becomes* a feeling, an experience, a thought, a perception, because we *are* the meaning-making context. (p. 11, emphasis in the original)

Kegan's (1994) theory included six forms of meaning-making called orders of consciousness. As a person progresses through and between these orders, changes occur in his or her perception of self, relation to others, and understanding of experiences. Kegan (1994) suggested that the majority of the adult population (from late adolescence through adulthood) makes meaning at or between order 3 and order 4. "Order 3 meaning makers co-construct their sense of meaning with other persons and sources (books, ideas) in their environment. They are not psychologically differentiated from these 'co-constructions'" (Ignelzi, 2000, p. 7). Examples of this phenomenon provided by Ignelzi (2000) follow in Table 1. The individual's sense of meaning-making resides partly with others and partly inside of the self, "so there is no coherent sense of meaning-making or self apart from those other people and sources" (Ignelzi, 2000, p. 8). Self-authorship is key to an order 4 meaning maker. Ignelizi (2000) contended that

> the order 4 individual transcends the co-constructed self of order 3 by developing the ability to differentiate a self-standard apart from, but in relation to, other people and sources . . . the self can internalize multiple points of view, reflect on them, and construct them into one's own theory about oneself and one's experience. (p. 8)

The self of the order 4 meaning maker is authored internally; this gives the person an identity that remains stable across contexts and within relationships.

Table 1
Examples of Kegan's Orders Consciousness

Order 3	Order 4
The student is not psychologically differentiated from the co-constructors of the environment.	The student is psychologically differentiated from others. Self-authorship is seen at the key to the future.
The student's sense of self is based on fusion of others' expectations, ideas, and theories.	The student transcends the co-constructed reality of Order 3.
The student depends on instructors and peers to co-construct what she believes	The student uses internalized sources to self-author.
The student has difficulty with assignments requiring evaluation.	The student thrives on opportunities to take responsibility for his own learning.
The student will rely solely on the goals set by the professor and may hold the instructor responsible for unmet objectives. The student is sensitive to criticism as it co-constructs values and standards.	The student views criticism according to his own goals and ultimately decides the value of the critique.
The student requires a great deal of feedback and validation.	The student views the teacher as a co-investigator.

Examples provided by Ignelzi (2002)

Order 3 and order 4 meaning makers respond differently to educational contexts. Kegan (1994) argued that there is often a "developmental mismatch" between the meaning-making order of most college students (predominantly order 3) and the demands of contemporary learning culture (order 4). Kegan (1994) claimed that "educators asking for self-direction are asking students to change the way they understand themselves, their world, and the relationship between the two" (p. 275). Kegan (1994) summarizes these demands on students as the hidden curriculum. The hidden curriculum includes expectations to engage in:

- thinking critically,
- taking initiative,
- setting one's own goals and standards,
- using experts, institutions, and other resources to pursue learning goals,
- taking responsibility for direction in learning,
- taking responsibility for productivity in learning,
- having a sense of oneself as co-creator of the culture that shapes one,
- taking charge of the concepts of a course,
- reading actively with one's own purpose,
- writing for oneself (rather than for one's teachers), and
- bringing one's teachers into one's self-reflection (pp. 277, 285, 303).

Kegan concluded that higher education will not serve the real learning needs of adult students if it aspires to train adults to master the hidden curriculum rather than to "*educate* adults to the order of consciousness that enables these behaviors" (p. 287, emphasis in the original). Kegan warned that focusing on training rather than education

does not meet the needs of contemporary adult students. Kegan argued that adult students need to be exposed to a wide variety of academic disciplines to value connection in and through academic communities and to learn that academic disciplines do not create the Truth but offer more or less internally consistent systems for organizing knowledge. The experience of viewing the world through various academic lenses fosters personal, academic, and epistemic growth. Kegan (1994) pointed out that it is this kind of growth—rather than specialized knowledge—that best prepares adult students for the demands of modern society. Kegan (1994) wrote, "Ironically, the kind of growth that is most likely to occur—from the third to the fourth order of consciousness—may be the very height of practicality in a modernist culture" (p. 293).

Supporting the Development Toward Self-Authorship

The need to move students toward the fourth order of consciousness and self authorship have been extensively outlined in the developmental literature. Kegan (1994) posited the notion that the "principal mission of adult education should be" to "support modernity's order of consciousness" (287). Likewise, King and Baxter Magolda (1996) suggested that "the achievement of self-authorship and personal authority should be heralded as a central purpose of higher education" (p. 166). Ignelzi (2000) addressed the question of how faculty can best support development toward self-authorship.

According to Ignelzi (2000), the first means in leading students toward self-authorship is comprehending and valuing how the learner understands his or her experience. Kegan (1982) suggested that to effectively help others, instructors need to be able to empathetically communicate that they understand the other's perspective. Those

learners at the third order of consciousness need to feel supported by the faculty with whom they are co-constructing meaning.

The second tool in moving students from order 3 to order 4 level of consciousness is providing learning experiences that push students toward generating their own ideas and theories about the course material. These learning tasks should be incrementally structured, and instructor supervision and feedback should help students gain self-authoring skills as they complete critical thinking exercises, ethical dilemma discussions, and learning journals.

The third practice Ignelzi (2000) suggested is including group work to facilitate movement from order 3 to order 4 meaning-making. Group work helps students differentiate self-views and the views of others. Those group members closer to order 4 meaning-making will assert their self-authored views, and this will encourage the other group members to articulate and assume responsibility for their own views.

Last, Ignelzi (2000) suggested that the move toward self-authorship should be acknowledged, reinforced, and celebrated as it occurs. The instructor should provide appropriate feedback to the student through the form of evaluations and formative assessment. Ignelzi (2000) wrote, “Students should be given opportunities to reflect on their thoughts and feelings about leaving the comfort of co-constructing the self to the somewhat frightening order 4 recognition that one is responsible for one’s own experience and self-construction” (p. 13). Kegan (1994) argued that educators must build developmental bridges that are meaningful to the students’ current meaning-making and facilitate a more complex way of making meaning.

The Study of Epistemological Beliefs

The research on epistemological beliefs overlaps with and is sometimes considered to be a specific subset of the study of cognitive and moral development. Studies of personal epistemology are varied and span many disciplines, drawing on theoretical constructs from educational, developmental, and instructional psychology, as well as on various aspects of educational research, including counseling, science and math education, higher education, reading and literacy studies, and teacher education. The research questions that appear most frequently within the educational and social sciences are about how individuals develop conceptions of knowledge and how those conceptions inform, shape, and mature into a world view. Specific epistemological research includes studies pertaining to "beliefs about the definition of knowledge, how knowledge is constructed, how knowledge is evaluated, where knowledge resides, and how knowing occurs" (Hofer, 2002, p. 4).

Perry's Study of Personal Epistemology

The study of personal epistemology began with Perry's (1968) investigation of Harvard undergraduate students. Perry's team of investigators interviewed the subjects over their four-year college experience. From these interviews, Perry developed a hypothesis of nine developmental stages that range from dualistic thinking in early college years to complex, relativistic thinking at the end of the college experience. Perry concluded that most first-year students believed that knowledge is gained by an omniscient authority handing down unchangeable facts to the recipient. By contrast, most students in their senior year believed that knowledge is tentative, rather than unchanging, and it is obtained through reasoning and inquiry. Students in this stage formed strong but

mutable commitments to ideas and concepts, and they recognized that there are multiple possibilities for knowledge and knowing.

In order to elucidate and explicate Perry's scheme of intellectual and ethical development, the scheme has been organized in a number of ways. Various models of the scheme include nine, four, three, or two parts. "Several authors (Brand, 1988; King, 1978; Kloss, 1994) suggest that the dominant pattern is four major groups within the nine positions" (Love & Guthrie, 1999, p. 8). The four groups include: Dualism (positions 1 and 2), Multiplicity (positions 3 and 4a), Relativism (positions 4b, 5, & 6), and Commitment in Relativism (positions 7, 8, and 9). Table 2 summarizes the characteristics of each group of Perry's scheme.

Table 2
Perry's Intellectual Scheme of Intellectual and Ethical Development

Dualism	Position 1 – Basic Dualism	Students believe the world is divided into absolutes—good and evil, right and wrong. Students believe that Authorities possess the right answers—the Truth.
	Transition between Position 1 and Position 2	Students acknowledge that Authorities disagree on what is the Truth.
	Position 2 – Multiplicity Prelegitimate	Students recognize but are opposed to ambiguity, abstractness, interpretation and less than clear-cut answers. Students begin to differentiate between good Authorities and bad Authorities.
	Transition between Position 2 and Position 3	Students in transition to Position 3 may divide knowledge into those disciplines that are definite, such as science and math, and those that are nebulous, such as the humanities and social sciences.

Table 2 (Continued)
Perry's Intellectual Scheme of Intellectual and Ethical Development

Multiplicity	Position 3 – Multiplicity Legitimate but Subordinate	Students accept the legitimacy of the idea that there is room for human uncertainty. Students believe that uncertainty does not affect the nature of Truth. Uncertainty is a temporary stage, and eventually the one right answer will be found.
	Transition between Position 3 and Position 4	Students recognize uncertainty as unavoidable. Students' loyalty to Authorities and the belief in Absolute truth diminishes. Students develop a larger tolerance for ambiguity with the realization that answers rarely come quickly and easily.
	Position 4a – Multiplicity Correlate	Students have a dualistic structure for their worlds: Authorities' right-wrong world is one facet and personal multiplicity is the other. In the sphere of Absolute knowledge, Authorities know the answers. Where Authorities do now know the answers, every person is entitled to his or her own opinion.
	Transition between Position 4a and Position 4b	Students are confined by their own argumentativeness. Students demand that Authority justify itself, and students find it necessary to justify their own opinions. Students begin to establish a domain separate from and equal to Authority; this is the beginning of relativistic thinking.
	Position 4b – Relativism Subordinate	Students recognize diverse opinions and are more tolerant of ambiguity. Knowledge is viewed as contextual. Knowledge is gained through analysis, interpretation, and comparison. Students consider some ideas better or worse than others rather than as right or wrong.

Table 2 (Continued)
Perry's Intellectual Scheme of Intellectual and Ethical Development

	Transition from Position 4 to Position 5	Students are aware of context and rules of evidence. Students realize that relativistic thinking will be required frequently in academic coursework and beyond.
Relativism	Position 5 – Relativism	Students adopt a new way of understanding the world characterized by seeing all knowledge as contextual, contingent, and relativistic. Students will also monitor and examine their metacognitive thinking processes. The notion of Authority becomes authority. Authority's assertions are open to evaluation.
Commitment in Relativism	Position 6 – Commitment Forseen	Students understand that commitments will need to be made in order to navigate a relativistic world. Students are unable to prioritize possibilities, decide on a course of action, or establish a commitment.
	Position 7 – Initial Commitment Position 8 – Orientation in Implications in Commitment Position 9 – Developing Commitments	Students commit to a course of action and commit to a life course.

Examples from Love & Guthrie, 1999.

The first position in Perry's (1970) scheme, basic dualism, is characterized by the belief that that the world is divided into absolutes such as good and bad and right and wrong. Students in this position believe that everything is known and that Authorities (uppercase A) pass down the answers—the Truth. The transition to the second position is

characterized by the realization that some Authorities disagree on what is the Truth. Position 2, multiplicity prelegitimate, is characterized by students recognizing but opposing pluralism. In this position, students remain loyal to Authority and seek answers from experts. Students in this stage do not value pluralism, abstractness, and interpretation as legitimate, and they will distinguish between good Authorities, such as a professor, and bad Authorities, such as a teaching assistant or another student.

The transition to position 3 is stimulated for students by good Authorities acknowledging that they do not have all of the answers. Students who are struggling with the transition to position 3 may divide knowledge into those disciplines which are definite (science and math) and those which are more nebulous (humanities and social sciences) (Perry, 1981 as cited in Love & Guthrie, 1999, p. 9). Students in position 3, multiplicity legitimate but subordinate, accept the legitimacy of the idea that there is room for human uncertainty. However, this uncertainty does not affect the nature of Truth because uncertainty is a temporary state, and eventually the one right answer will be found.

During the transition to position 4, students recognize uncertainty as unavoidable, and the loyalty to Authorities and the belief in Absolute truth diminish (Perry, 1981 as cited in Love & Guthrie, 1999, p. 10). Students develop a larger tolerance for ambiguity with the realization that answers rarely come quickly and easily. In position 4, late multiplicity, “Perry and his colleagues identified two different paths students took. Basically, students split into two groups in position 4, only to be reunited in position 5” (Love & Guthrie, 1999, p. 10). Position 4a, multiplicity correlate, students develop a dualistic mindset where they

> create a world of double dualism of a world in which the Authority's right-wrong world is one element and personalistic diversity [multiplicity] is the other. The students have thus succeeded in preserving a dualistic structure for their worlds and at the same time have carved out for themselves a domain promising absolute freedom. In saying in this domain, "Everyone has a right to [his/her] own opinion," students are also saying, "Where Authorities do not know the Answer, any opinion is as good as any other." (Perry, 1981, p. 84 as cited in Love & Guthrie, 1999, p. 10)

In this position, students' views of issues and questions fall into two categories: those with certain answers and those with uncertain answers. Authorities still have the Truth for those items that can be answered with certainty. However, for those items not associated with certainty, everyone is entitled to his/her own opinion. Perry (1981) contended that multiplicity should not be rendered an excuse to simply discount the opinions with which one does not agree. Rather, Perry claimed that the egalitarian belief that all opinions are valid and have equal worth "expresses a respect for others through a respect for their views" (p. 85).

During the transition to 4b, students are confined by their own confrontations. Perry (1970) pointed out that "unable to leave well enough alone, [students] demand that Authority justify itself by *reasons* and . . . by *evidence*" in order to prove that the opinion of the authority is superior to the student's opinion (p. 99, emphasis in the original). Students also justify their own opinions as well; this behavior is indicative of the beginnings of developmental stage of relativism. Perry (1970) writes,

> The establishment of a domain separate and equal to that of Authority, in which the self takes a stand in chaos, will provide (once contextual thought is discovered to provide some order) a platform from which Authority may be viewed with entirely new eyes . . . . The bridge to the new world is the distinction between an opinion and a supported opinion. (pp. 99-100)

Position 4b, relativism subordinate, is characterized by students viewing the world from a multiplistic position. Students recognize ambiguity and diversity in opinions. Knowledge is viewed as contextual and based on analysis, comparison, point of view, and interpretation (Perry 1970). Students' world view goes beyond multiplicity; ideas are considered better or worse rather than right or wrong.

The transition to position 5 occurs as students realize that relativistic thinking will be frequently required in college coursework and beyond. Moving into position 5, relativism, requires adopting a new way of understanding, evaluating, and analyzing that is more integrated than in the dualism that occurs in positions 4a and 4b; students must radically restructure their thinking in order to see all knowledge as contextual and relativistic; likewise, students will also monitor and examine their own thinking processes (metacognition). Perry (1970) wrote that in position 5 relativistic thinking becomes normalized and habitual; this begins as a conscious process and then becomes an automatic process. The notion of Authority becomes authority; authority's contentions have become open to evaluation, and authorities are recognized in a relativistic grouping.

The next positions in Perry's (1970) scheme are characterized by commitments in relativism. In position 6, commitment foreseen, students understand that commitments will need to be made in order to navigate a relativistic world. Love and Guthrie (1999)

contended that “at this point students feel the beginnings of a desire to define their personal choices, believing that to remain undefined or uncommitted would be irresponsible” (p. 12). However, students in position 6 are unable to prioritize possibilities, decide on a course of action, or establish a commitment. In the following positions, 7-9 (initial commitment, orientation in implications in commitment, and developing commitments), students commit to a course of action and commit to a life course. These last stages were the least developed in Perry’s scheme; they only comprised one chapter of Perry’s (1970) work. In the subsequent explication of the theory, Perry (1981) only devoted two pages of a forty-page chapter to positions 7-9.

Although Perry’s scheme of intellectual and ethical development is almost 40 years old, it endures today and is still relevant in many ways. Perry’s work is the central point out of which the knowledge base on personal epistemology has materialized. Many of Perry’s original theories, such as the idea of movement from dualistic thinking (ideas are absolutely right or wrong) to relativism (some ideas are better than others), permeates the research agendas of those building on Perry’s work.

Research Based on Perry’s Study

Perry’s work has inspired numerous studies on personal epistemology. Various studies following Perry’s research have been based on the assumption that personal epistemology is unidimensional. Many of these researchers based their models on Perry’s idea that personal epistemology progresses and develops in identifiable, fixed stages (Knefelkamp & Slepitza, 1978; Ryan, 1984; Touchton, Wertheimer, Cornfeld, & Harrison, 1977). Other researchers have formulated theories based on Perry’s work that diverge from Perry’s initial conceptions. For example, Schommer (1990) posited the

notion that the nature of personal epistemology is multidimensional and these dimensions develop more or less independently of each other. Research based on Perry's initial study spans inquires into the nature of knowledge and reality (King & Kitchener, 1994), the effect gender differences have on epistemological beliefs (Baxter Magolda, 1998; Belenky, Clinchy, Goldberger, & Tarule, 1986; Goldberger, 1996), and the dimensionality of epistemological beliefs (Schommer, 1989a, 1990, 1993a, 1993b, 1994; Schommer-Aikins, 2002, 2004; Schommer-Aikins, Duell, & Barker, 2003; Schommer, Calvert, Gariglietti, & Bajaja, 1997; Schommer, Crouse, & Rhodes, 1992; Schommer & Dunnell, 1997; Schommer& Walker, 1995, 1997).

Research on Conceptions of Knowledge and Reality

Building on the work of Perry (1968), King and Kitchener (1994) proposed a seven stage model of Reflective Judgment. In early stages of this model, pre-reflective reasoning, students believe that knowledge comes from an authority figure or through direct observation. They believe that what they know is certain. In the middle stages of development, quasi-reflective reasoning, students begin to recognize that knowledge is uncertain, and their conception of reality as certain begins to metamorphose. They begin to recognize elements of uncertainty in knowledge claims; at this stage the uncertainty is mostly attributed to lack of evidence. During the final stages of development, reflective reasoning, students view reality as contextual and believe that some claims are deemed better than others based on reasoning and evidence. They believe that their decisions must be based on evidence and on reflection.

Research on Gender Differences

Belenky et al. (1986) and Baxter Magolda (1998) have built on the work of Perry (1968) in the exploration of the influences of gender differences on epistemological beliefs. Belenky et al. (1986) specifically focused on the developmental stages of women. Their study of 135 women generated five epistemological perspectives: silence, received knowing, subjectivism, procedural knowing, and constructed knowing. In a pre stage of development, silence, women may see themselves as unable to understand and remember knowledge that is passed down from an authority figure. Goldberger (1996) asserted that silence is not a step in normal development but is a failure to develop, a "position of not knowing" (p. 4). During the developmental stage of received knowing, women believe that the world can be seen in binary opposition: black and white, true and false, good and bad, and right and wrong. There is no room for or conception of ambiguity. During this stage, women believe that knowledge is absolute and comes from an outside authority. In the middle stages, women view knowledge as subjective, personal, and intuitive. During the stage of subjectivism, women begin to look within themselves for instinctual and intuitive ways of knowing. Subjective knowers are suspicious of knowledge dispensed by authorities. The next stage, procedural knowing, is characterized by the belief that knowledge is a process. Procedural knowing includes two facets, separate knowing--detached, objective, and critical knowing--and connected knowing—connected, subjective, and supportive knowing. Connected knowing builds on the positive aspects of Subjectivism; connected knowers respect the opinions of others, but unlike subjectivist knowers, connected knowers can engage in genuine dialogue. Advanced stages of development are characterized by viewing knowledge both objectively and subjectively.

In the constructed knowing stage, the women believe that "all knowledge is constructed, and the knower is an intimate part of the known" (p. 137).

Baxter Magolda (1998) expanded Perry's work by comparing the epistemological beliefs of men and women. Baxter Magolda found that in early stages, women were more likely to accept knowledge while men were more likely to master knowledge through a process of questioning. In the middle or transitional stages, women were more likely to focus on personal justification and men focused on impersonal justification. In the final stages of development, women were likely to seek justification through interaction with others while men did not need the interaction of others.

In other research, Baxter Magolda (2002) conducted a longitudinal study of 101 traditional-aged college students (51 women and 50 men); this study spanned 12 years. Eighty students participated in the study throughout four years in college. By year 12 of the study, 39 participants remained. The patterns of development that emerged from this study for both men and women include movement from absolute knowledge, to transitional knowing, to independent knowing. During four years of college, the pattern of the nature of knowledge transitions from certain to uncertain. In the post-college years, the participants in Baxter Magolda's study made the shift from external to internal sources of knowledge. Three distinct phases emerged in the post-college interviews. In the initial phase of contextual knowing, participants relied on external formulas to help solidify beliefs. The second stage was comprised of a search for internal authority. Participants used books, mentors, and professional counseling to assist them with solidifying their own voices. The third stage consisted of establishing a foundation of epistemological beliefs that guided life and work choices. In this stage, the participants

integrated the belief that knowledge is contextual, the cognitive process of deciding what to believe, and the internally defined self in the knowledge construction process (Baxter Magolda, 2002, p. 100).

The More or Less Independent Dimensions of Epistemological Beliefs Proposed by Schommer

In 1990, Schommer hypothesized that personal epistemology is a system of more or less independent beliefs. According to this theory, multiple beliefs make up one's personal epistemology, and these beliefs may or may not develop at the same rate. Schommer (1990) hypothesized that personal epistemology is multi-dimensional, and "beliefs about the nature of knowledge are far too complex to be captured in a single dimension" (p. 498). Schommer proposed that there are at least five dimensions of personal epistemology including the structure of knowledge, the certainty of knowledge, the sources of knowledge, the control of learning, and the speed of knowledge acquisition.

Schommer's research is, in many ways, significantly different from the earlier research on epistemological beliefs (Dweck & Legget, 1988; King & Kitchener, 1994; Knefelkamp & Slepitza, 1978; Perry, 1968; Ryan 1984; Schoenfeld 1983, 1985). Six significant items differentiate Schommer's research from previous studies. These major differences include:

1. Schommer includes beliefs about learning;
2. Schommer identifies distinct beliefs;
3. Schommer's model includes the more or less hypothesis that beliefs are more or less independent of one another and do not necessarily develop at the same rate;

4. Schommer's theory acknowledges the need for balance;
5. Schommer introduces a nomenclature for epistemological beliefs; and
6. Schommer utilizes quantitative, rather than qualitative, research methodologies to investigate epistemological beliefs.

Schommer's research on epistemological beliefs was built on the work of Perry (1968) and Kitchener and King (1989). Based on these previous works, Schommer hypothesized about the structure, source, and stability of knowledge. Likewise, Schommer expanded on Schoenfeld's (1983, 1985) work to develop the hypotheses about learners having independent beliefs and about learner's beliefs about knowledge and learning. The hypotheses about the source of knowledge, the role of authority, and the role of quick learning were derived from the works of Perry (1968) and Schoenfeld (1983, 1985).

Schommer also drew on the work of Dweck and Leggett (1988) to clarify the hypothesis regarding the importance of beliefs concerning innate ability. In the work of Dweck and Leggett (1988), children who believed in fixed ability to learn were more likely to give up on difficult mathematical tasks and to exhibit helpless behaviors than children who did not have this belief. Under similar circumstances, children with a belief that the ability to learn can improve were persistent in staying on task and attempting alternate strategies when they failed.

From a methodological perspective, Schommer drew heavily upon the work of Ryan (1984). Ryan's work is based on Perry's (1968) early work with epistemological beliefs. Perry's original study relied heavily on interviews and thick description, although Perry made minimal use of a questionnaire. Ryan (1984), on the other hand, developed a

questionnaire focused on a single notion that Perry's epistemological belief system as the structure of knowledge. Ryan used a short questionnaire to assess students' beliefs about the degree to which they saw knowledge as dependent on context or as simply right and wrong. In other words, Ryan surveyed the participants' epistemological beliefs regarding knowledge as something that is dualistic or relativistic. Ryan found that there was a positive correlation between students' belief in knowledge as dualistic and their opinion that understanding a topic means the ability to recall a list of facts. Ryan also found that those with relativistic epistemological beliefs said they achieved understanding when they could apply the information to new situations and when they could see connections between ideas. This work was a foundation for Schommer's quantitative research about the nature of personal epistemology.

Drawing on much of the previous research on personal epistemology, Schommer posited these hypotheses regarding beliefs about the nature of knowledge and knowing. Schommer's study included research hypotheses about

1. the stability of knowledge as something that ranges from unchanging to always tentative;
2. the structure of knowledge that ranges from a conception of knowledge as isolated bits of information to integrated and interconnected concepts;
3. the sources of knowledge ranging from omniscient external authority to knowledge gleaned from reason and evidence;
4. the speed of learning ranging from quick or not-at-all to gradual learning over time; and

5. the ability to learn ranging from innate at birth to something that can be improved and developed over time (Schommer-Aikins, 2004, p. 20).

Schommer's Experimental Research on Epistemological Beliefs

Schommer has produced over 15 articles and experimental studies on epistemological beliefs, and her works are frequently cited in the personal epistemology literature. Clarebout, Elen, Luyten, & Bamps (2001) wrote, "It is widely acknowledged that Schommer's work has questioned existing conceptions of epistemological beliefs by introducing conceptually appealing ideas. Moreover, large-scale empirical research on the topic was made possible by introducing an easily administered research instrument" (p. 73). Complete or adapted versions of Schommer's Epistemological Questionnaire (SEQ) have been utilized in 19 doctoral dissertations and masters theses. Additionally, Schommer's research has been cited as a primary contributor the theory base in personal epistemology in over 20 other empirical studies.

Schommer's early research focused on developing a questionnaire used to identify epistemological beliefs. This research comprised her dissertation where the SEQ was administered along with measures of verbal ability and prior knowledge to 266 undergraduate students. Schommer also collected demographic information from the participants. The research question for Schommer's dissertation was "Do students' epistemological beliefs affect their comprehension?" (Schommer, 1989a).

The design of this study included four components. First, a group of students read a passage on one of two topics, psychology or nutrition. The students were asked to write a concluding paragraph for the passage. The participants were given the following instructions:

> Imagine that you are the *author* of the textbook chapter that you read for this research project. You've got it all done except for the conclusion. Please complete the chapter by writing a good final paragraph that *draws a conclusion (or conclusions)* based on what is already written in the chapter. Be as clear as possible in your conclusions. (Schommer, 1990, p. 501, emphasis in the original)

Next, the students assessed their understanding of the passage. Last, a multiple choice test was administered to test mastery of the major concepts from the passage. Factor analysis of the SEQ revealed four significant factors:

1. the ability to learn is innate,
2. knowledge is discrete and unambiguous,
3. learning is quick or not-at-all, and
4. knowledge is certain.

The written conclusions were coded for degree of simplicity or complexity and certainty or uncertainty on a dichotomous scale. Schommer measured the effect of epistemological beliefs on the participants' conclusions by regressing comprehension test scores with measures of verbal ability, prior knowledge, and gender.

Schommer found that epistemological factors predicted participants' interpretation of the passage. The more students believed that knowledge is certain, the more likely they were to treat inconclusive information as certain knowledge. Likewise, the more students believed learning is quick or not-at-all, the more likely they were to perform poorly on the comprehension assessment measures and to accurately estimate their levels of comprehension. The results of this study suggested that there is a link between students' epistemological beliefs and comprehension (Schommer, 1989a).

Schommer later published the findings from her dissertation in an Education Resources Information Center (ERIC) Report with the US Department of Education (Schommer, 1989b) and in *The Journal of Educational Psychology* (Schommer, 1990). In a continuation of her previous research, Schommer, Crouse, and Rhodes (1992) examined the relationship between belief in simple knowledge and mathematical test comprehension. The researchers tested the hypothesis that epistemological beliefs affect academic performance by playing a crucial role in the planning and assessment of learners' comprehension. Simply put, the researchers proposed that epistemological beliefs could affect the ways in which a learner plans to study.

In the first experiment, the researchers replicated the factor structure of Schommer's (1990) study with 424 students (157 men and 267 women) enrolled in an introductory psychology class. The majority (89.2%) were freshman and sophomore students ranging in age from 17 to 65 years old, with a mean age of 22. The SEQ was administered to the participants, and the results were similar to the previous study (Schommer et al., 1992, pp. 438-39).

A sample of the participants from the first experiment participated in the second experiment. The sample was composed of 138 participants (39 men and 99 women) with a mean age of 25. The majority of the participants were freshmen (66.7%) and sophomores (18.8%). In this study, participants were given modified excerpts on measures of central tendency from an introductory research methods text book, and the two groups of students were given differing sets of instructions. The first group was asked to read a passage and evaluate its clarity and readability for college freshmen. The

second group was asked to prepare to teach the information in the passage (Schommer et al., 1992, p. 439).

The students were administered tests on their comprehension of the materials. Six of the 15 items on the test required recall of particular information from the passages, and the remaining items required application of information from the passages. In order to assess their confidence, the participants rated their understanding of the passage. Data was also gathered on the students' prior knowledge of the material and on the study strategies the students employed.

The results of these experiments suggested that belief in simple knowledge predicted test performance and overconfidence in comprehension. The researchers concluded that the "influence of simple knowledge on comprehension may be mediated by study strategy selection" (Schommer et al., 1992, p. 441). Finally, the researchers concluded that the "epistemological questionnaire provides the groundwork for development of epistemological assessment" (Schommer et al., 1992, p. 441).

In other studies, Schommer and Dunnell (1994, 1997) compared epistemological beliefs of gifted and non-gifted high school students. The SEQ was modified for secondary students. Over 1100 high school students completed the questionnaire, and the four factor structure was replicated with this group. The results of this study suggested that there were no differences between gifted and non-gifted students' epistemological beliefs during the freshman year of high school. However, during the senior year of high school, gifted students were less likely to believe in simple knowledge and quick learning.

In the next experiment, Schommer (1993a) studied postsecondary students' epistemological beliefs in the areas of simple knowledge, certain knowledge, innate ability, and quick learning. Schommer compared the beliefs of junior college and university students and technical science and social science majors. Schommer's research questions were first, "Is there a difference in the epistemological beliefs of university and junior college students?" and second, "Is there a difference in epistemological beliefs between students in the technical and social sciences?"

In this study, 236 students from a junior college and a large university were administered the SEQ and a survey on demographics and upbringing. The sample included 58 men and 58 women enrolled in introductory psychology, introductory educational psychology, or introductory physics courses. Students were surveyed to determine demographic information. Additionally, items to evaluate students' upbringing were included. These items included the family structure, the role of rules and authority in the family, and encouragement to be independent.

Schommer found differences in all epistemological beliefs between junior college and university students. Schommer also found that family life was an important contributor to epistemological predispositions and that epistemological beliefs in early college years tend to be general rather than specific to a particular domain.

In another investigation, Schommer (1993b) focused on the development of secondary students' epistemological beliefs and the influences these beliefs have on academic performance. Students were given a modified version of the SEQ. The sample included 405 freshmen, 312 sophomores, 274 juniors, and 191 seniors. Grade point

averages, which were available for 869 students in the sample, served as a measure of academic performance.

Schommer (1993b) found that epistemological development occurred during high school. Belief in simple knowledge, certain knowledge, and quick learning changed between the freshman and senior years. Schommer (1993b) also found that epistemological beliefs predicted grade point average (GPA). Belief in quick learning predicted academic performance. Schommer (1993b) hypothesized that these results support earlier findings that belief in certainty relates to certain responses to tentative information. The findings are also consistent with earlier research that pointed out that belief in simple knowledge related to comprehension of a passage (Schommer et al., 1992) and that the belief in fixed ability influenced motivation and persistence in staying on task (Dweck & Leggett, 1988).

In 1994, Schommer proposed a theoretical framework describing the epistemological belief system based on the literature in the field, previous studies, and reflection. This model described personal epistemology as a system of beliefs. In other words, Schommer hypothesized that personal epistemology is composed of more than one belief. Schommer's previous models included either four or five epistemological beliefs. The second part of this model suggested that epistemological beliefs are more or less independent and do not develop synchronously. A third piece of this model included the idea that epistemological beliefs "are better characterized as frequency distributions rather than dichotomies or continuums" (Schommer-Aikins, 2002, p. 106). Schommer (1994) suggested that a learner with a sophisticated epistemological belief system will consider a small amount of knowledge unchanging and a substantial amount of

knowledge as mutable. The fourth piece of the model suggested that epistemological beliefs have both a direct and indirect effect on learning. Schommer-Aikins (2002) (formerly Schommer) pointed out that an indirect effect could be employing a preferred study strategy, such as memorization, based on an epistemological belief that knowledge is certain. A direct effect could be interpreting tentative knowledge as certain because of this same epistemological belief. The next claim in the model was that regardless of whether epistemological beliefs are domain specific or domain independent, epistemological beliefs will change over time. Schommer (1994) also posited the notion that epistemological beliefs are influenced by educational and personal experiences.

Schommer's next research question focused on the domain specificity or generality of epistemological beliefs (Schommer & Walker, 1995). During the first experiment in this study, SEQ was administered to 39 students who read a social science passage. Another 56 students were administered the questionnaire and read a mathematics passage. The students were asked to complete the questionnaire with the respective domains in mind. For this experiment, the researchers analyzed correlations between corresponding domain-specific epistemological beliefs. The researchers also analyzed the consistency of epistemological sophistication across domains. In the second experiment, 114 students from an undergraduate psychology class participated in the study. Twenty-three students were assigned to a control group that completed the SEQ twice with the social sciences in mind. The experimental groups completed the SEQ in both domains; 43 read the social science passage while 40 read the mathematics passage. As in the first experiment, all students completed the SEQ.

The results of this study supported the hypothesis that epistemological beliefs are similar across domains. There were substantial correlations between epistemological factors across domains. Schommer and Walker (1995) concluded that "it appears that researchers may assume that epistemological beliefs tend to be domain independent among college students in their early years" (p. 430).

Schommer's next study examined the epistemological beliefs of gifted high school students. Schommer's and Dunnell's (1997) research questions for this study included the sophistication and variability of the epistemological beliefs of gifted students. One question was whether gifted students tend to have sophisticated beliefs. A second question focused on the inconsistency of beliefs among gifted students. The researchers questioned the role of these beliefs in predicting academic performance. The sample for this study consisted of 69 gifted students (13 freshmen, 15 sophomores, 18 juniors, and 23 seniors) from a Midwestern high school. These students scored in at least the 97th percentile on a standardized intelligence test or ranked at least in the 95th percentile in two or more areas on standardized academic achievement tests. The students were administered the SEQ and were assessed on their solutions to problems about school and everyday life through a series of responses to letters to Dear Abby. The results indicated that gifted students vary in their epistemological beliefs. Schommer and Dunnell (1997) pointed to many implications for practice related to this finding.

In a longitudinal study, Schommer, Calvert, Gariglietti, and Bajaj (1997) continued Schommer's (1993b) study about the development of secondary students' epistemological beliefs. In this study, Schommer et al. (1997) addressed four research questions:

1. Do the epistemological beliefs of students change over time?
2. Are there differences in epistemological beliefs that can be attributed to gender?
3. Are there year by gender interaction effects for epistemological beliefs? and
4. Do epistemological beliefs act as a predictor of academic performance? (Schommer et al., 1997, p. 39).

In this study, high school seniors completed the SEQ in 1995. This group was a random sample of the students who completed the questionnaire as freshmen in 1992. The researchers concluded that all four epistemological beliefs, quick learning, innate ability, simple knowledge, and certain knowledge, became more sophisticated as students matured.

In 1997, Schommer and Walker examined the relationship between high school students' epistemological beliefs and their attitudes toward education. In this study, 158 high school students completed the SEQ and answered open-ended questions about a hypothetical character, a fictitious young man named Billy, who was deciding whether or not to attend college. Additionally, the students answered questions about their own feelings about high school and their expectations for college. The students' attitudes toward school were regressed on their epistemological beliefs factor scores. The researchers found that the less that students believed in quick learning and in fixed ability, the more likely they were to suggest that Billy go to college and appreciate education as a means to improve his financial and social status.

Schommer and Walker (1997) discussed in detail the implications for how epistemological beliefs can affect retention of students. They reasoned that "the

cumulative evidence on epistemological beliefs suggests that epistemological beliefs of incoming college freshmen may serve to predict their academic success" (p. 184). Students demonstrating unsophisticated epistemological beliefs may need individual instruction in the nature of knowledge as well as in study strategies. The authors suggested ways that strategies for developing epistemological beliefs can be integrated into the curriculum. Also, the authors contended that the epistemological beliefs of the faculty must be clarified and justified for students. The implications for learning need to be articulated and assessed in the classroom. Schommer and Walker (1997) pointed out "if students understand the rationale for course objectives and assessment techniques, they are likely to value the instruction" (p. 184).

In *Adult Learning and Development: Perspectives from Educational Psychology*, Schommer (1998) turned her attention to adult's epistemological beliefs. Schommer made a case for the subtle, yet overarching, effects epistemological beliefs have on adults' lives. Next, Schommer outlined the potential influence epistemological beliefs have in adult learning. Specifically, Schommer contended that epistemological beliefs affect comprehension, metacomprehension, and problem solving. Third, Schommer pointed out the roles epistemological beliefs have in the work lives of adults; Schommer gave numerous examples of ways in which unsophisticated epistemological beliefs, manifested as rigid thinking, could result in poor work performance. Finally, Schommer presented her research agenda as evidence to support her hypotheses about the effects of epistemological beliefs on the lives of adults. Schommer concluded that sophisticated epistemological beliefs equip adults to solve work and personal problems.

In 2002, Schommer-Aikins (formerly Schommer) published a reflective article outlining changes in thinking about epistemological beliefs over time and suggestions for further study in the field. Schommer-Aikins (2002) reiterated that the study of epistemological beliefs is an important endeavor because it helps researchers and practitioners to understand learners, gives direction in how teachers can better serve learners, and informs other theories of cognition and affect. Schommer-Aikins stressed the meta-theme of balance and presented this theme as an antithesis of unrestrained relativism. Schommer-Aikins argued that epistemological beliefs "will vary in multiplicity, generality, and independence over time" (p. 109). Additionally, Schommer-Aikins posited the notion that the number, the domain, and the scope of epistemological beliefs will fluctuate as individuals develop. Because of this, Schommer-Aikins argued that development, as a lifelong process, is a key influence on the other variables in the development of an epistemological belief system. Schommer-Aikins hypothesizes that a small core of epistemological beliefs may provide the basis for later development. Schommer-Aikins suggested research methodologies for future studies and pointed out that multiple approaches to assessment are needed, and measurements should control for the developmental level of the participant. Last, Schommer-Aikins suggested that future studies should strive to understand epistemological beliefs from the students' perspective.

In the next step in Schommer-Aikins's research agenda, Schommer-Aikins, Duell, and Barker (2003) investigated students' epistemological beliefs across domains. The researchers used Biglan's (1973) classification of academic disciplines to differentiate between hard and soft disciplines and pure and applied disciplines. In this study, 152 university students completed three questionnaires derived from the SEQ that assessed

their beliefs about mathematics (hard-pure), the social sciences (pure), and business (neither pure nor hard). The results of this study supported the previous research (Fishback, 1997; Schommer & Walker, 1995) showing that the epistemological beliefs of college undergraduates are not domain specific. The results also supported Sternberg's (1989) assertion that the dichotomy of domain generality/specificity is an assumption that should be questioned.

Schommer-Aikin's (2004) latest work is an embedded systematic model of personal epistemology. In this work, Schommer-Aikins (2004) advocated a team approach to further research on this topic. Specifically Schommer-Aikins contended that there is a need to study epistemological beliefs including beliefs about knowledge, beliefs about ways of knowing, beliefs about learning, school performance, and self-regulated learning. These beliefs are embedded within other systems, such as cultural views, social relationships, environmental influences, cultural influences, and personal context. This model is very complex; therefore, Schommer-Aikins (2004) proposed a coordinated teams approach for the study of embedded systemic models of personal epistemology. In this model, Schommer-Aikins suggested that the experts on various systems (motivation, emotion, cognition, etc.) and from different fields (social sciences, education, etc.) use different research methodologies (descriptive studies, true experiments, etc.) in their studies. The researchers would utilize a teamwork approach to better enable their individual studies to contribute to a larger literature base. Third, "dynamic-fluid" models of epistemological beliefs systems need to be developed. Fourth, throughout the coordinated teams approach, the notion of balance needs to be embraced (it is the task of the researchers to define balance and to conceive of how to measure it). Last, teams can

test complex research questions and models by working together and dividing the research into various strands of inquiry.

Over the past 15 years, Schommer has conducted many studies on personal epistemology and has produced many articles on the subject. A summary of Schommer's studies follows in Table 3.

Table 3
A Summary of Schommer's Studies 1989-2004

	Title	Research Questions or Research Subject	Findings and Conclusions
Schommer, M. (1989a).	The effects of beliefs about the nature of knowledge on comprehension.	Do student's epistemological beliefs affect their comprehension?	The Schommer Epistemological Questionnaire revealed four significant factors: 1. the ability to learn is innate, 2. knowledge is discrete and unambiguous 3. learning is quick or not-at-all 4. knowledge is certain.
Schommer, M. (1989b).	Students' beliefs about the nature of knowledge: What are they and how do they affect comprehension?	What is the effect of epistemological beliefs on mathematical test comprehension?	Belief in simple knowledge predicted test performance and overconfidence in comprehension.
Schommer, M., Crouse, A., & Rhodes, N. (1992).	Epistemological beliefs and mathematical text comprehension: Believing it is simple does not make is so.	What is the effect of epistemological beliefs on mathematical test comprehension?	The influence of simple knowledge on comprehension may be mediated by study strategy selection.

Table 3 (Continued)
A Summary of Schommer's Studies 1989-2004

	Title	Research Questions or Research Subject	Findings and Conclusions
Schommer, M. (1990).	The effects of beliefs about the nature of knowledge on comprehension.	What is the effect of epistemological beliefs on knowledge comprehension?	The more students believed that knowledge is certain, the more likely they were to treat inconclusive information as certain. The more students believed learning is quick or not-at-all, the more likely they were to perform poorly on the comprehension assessment measures and to accurately estimate their levels of comprehension.
Schommer, M., & Dunnell, P. (1994).	A comparison of epistemological beliefs between gifted and non-gifted high school students.	Are there differences in the epistemological beliefs of gifted and non-gifted high school students?	There are no significant differences between gifted and non-gifted students' epistemological beliefs during the freshman year of high school. During the senior year of high school, gifted students were less likely to believe in simple knowledge.
Schommer, M. (1993a).	Comparisons of beliefs about the nature of knowledge and learning among postsecondary students.	Is there a difference in the epistemological beliefs of university and junior college students? Is there a difference in epistemological beliefs between students in the technical and social sciences?	There were significant differences in the epistemological beliefs of junior college and university students, and those differences tended to be general rather than domain specific.

Table 3 (Continued)
A Summary of Schommer's Studies 1989-2004

	Title	Research Questions or Research Subject	Findings and Conclusions
Schommer, M. (1993b).	Epistemological development and academic performance among secondary students.	How do secondary students' beliefs develop over time?	Belief in certain knowledge, simple knowledge, and quick learning change between freshman and senior years. Belief in quick learning predicts academic performance.
Schommer, M. (1994).	An emerging conceptualization of epistemological beliefs and their role in learning.	Schommer proposed a model of epistemological beliefs.	There are four or five statistically significant epistemological beliefs that are more or less independent of one another. Epistemological beliefs have a direct and an indirect effect on learning. Epistemological beliefs are influenced by educational and personal experiences, and they change over time.
Schommer, M., & Walker, K. (1995).	Are epistemological beliefs similar across domains?	Are epistemological beliefs domain specific?	The results of this study supported the hypothesis that epistemological beliefs are similar across domains.
Schommer, M., & Dunnell, P. (1997).	Epistemological beliefs of gifted high school students.	Do gifted students tend to have sophisticated epistemological beliefs? What are the epistemological differences within groups of gifted students?	Gifted students vary in their epistemological beliefs.

Table 3 (Continued)
A Summary of Schommer's Studies 1989-2004

	Title	Research Questions or Research Subject	Findings and Conclusions
Schommer, M., Calvert, C., Gariglietti, G., & Bajaj, A. (1997).	The development of epistemological beliefs among secondary education students: A longitudinal study.	1. Do epistemological beliefs change over time? 2. Are there differences in epistemological beliefs that can be attributed to gender? 3. Are there year by gender interaction effects for epistemological beliefs? 4. Do epistemological beliefs act as a predictor of academic performance?	All four epistemological beliefs became more sophisticated as the students matured.
Schommer, M., & Walker, K. (1997).	Epistemological beliefs and valuing school: Considerations for college admissions and retention.	Can epistemological beliefs affect retention of students?	Epistemological beliefs affect retention of students. Students with unsophisticated epistemological beliefs may need individual instruction with developing appropriate study strategies.
Schommer, M. (1998).	The role of adults' beliefs about knowledge in school, work, and everyday life.	Schommer discussed the effects epistemological beliefs have on the lives of adults.	Sophisticated epistemological beliefs equip adults to solve work and personal problems.

Table 3 (Continued)
A Summary of Schommer's Studies 1989-2004

	Title	Research Questions or Research Subject	Findings and Conclusions
Schommer-Aikins, M. (2002).	An evolving theoretical framework for epistemological belief system.	Schommer-Aikins reflected on changes in her thinking about personal epistemology over time and proposed suggestions for further study in the field.	There is a need for studies that strive to understand epistemological beliefs from a student's perspective.
Schommer-Aikins, M., Duell, O., K., & Barker, S. (2003).	Epistemological beliefs across domains using Biglan's classification of academic disciplines.	Are epistemological beliefs domain specific?	The epistemological beliefs of college undergraduates are not domain specific.
Schommer-Aikins, M. (2004).	Explaining the epistemological belief system: Introducing the embedded systematic model and coordinated research approach.	Schommer-Aikins proposes an embedded systematic model of personal epistemology.	Experts on various systems (motivation, emotion, cognition, etc.) use different research methodologies (descriptive studies, true experiments, etc.) in a coordinated teams approach to the study of personal epistemology.

The review of literature on epistemological beliefs began with the work of Perry (1968, 1970) and traced the course of the research on personal epistemology to the latest findings in the field. Hypothesized models of personal epistemology include those of King & Kitchener (1994), who propose a model of reflective judgment, and those of Belenky et al. (1986) and Baxter Magolda (1998) that explore the relationship between gender differences and epistemological beliefs. The principle focus of this section was on

the fifteen-year research agenda of Schommer-Aikins (formerly Schommer), who proposed a model of more or less independent epistemological beliefs.

Summary

This chapter included a thorough review of the literature on self-directed learning, cognitive and moral development, and personal epistemological beliefs. The literature from these areas provided a foundation for this study of the relationship between demographic and educational variables (as measured by the Demographic and Educational Questionnaire), learner epistemological beliefs (as measured by the SEQ), and learner perception of self-directed readiness (as measured by the SDLRS).

Several concepts that emerged from the review of literature are especially relevant to this study. The first relevant concept includes the developments that have occurred in the last thirty years in the research-base that shapes our current thinking about self-directed learning in the field of adult education. Self-directed learning has been defined in many ways. Some researchers, such as Knowles (1980), define self-directedness as a developmental stage while others, such as Brockett and Hiemstra (1991), define self-directed learning as a combination of learning preferences, ownership, and personal responsibility. Other researchers (Adenuga, 1991; Brookfield, 1986; Deroos 1982; Pratt 1984; Theil 1984) in the field of adult education have defined self-directed learning as characteristics related to learning style.

Guglielmino (1977) developed the SDLRS to measure learner's perceptions of their readiness to engage in self-directed activities. The personal and learning style factors measured by this instrument included love of learning, self-concept as a learner, tolerance of ambiguity, tolerance of risk, tolerance of complexity, creativity, initiative in

learning, self-understanding, acceptance of responsibility for learning, and view of learning as a beneficial process. The SDLRS has been used by more than 500 major organizations world-wide (Guglielmino & Associates, n.d., p. 1) and in more than 100 doctoral dissertation studies (Appendix A).

For many years, self-directed learning was generally accepted among adult educators as the most common form of adult learning (Cross 1981; Houle, 1993; Long & Morris, 1996; Tough, 1973). Brookfield (1985a) pointed out that "It is not uncommon to hear practitioners . . . declaring . . . self-directed learning [is] the goal and method of adult education" (p. 5). The cognitive and moral development literature base questioned this conventional wisdom and practice. The work of Kegan (1994) questioned adult students' readiness for self-directed learning when they enter the university. Kegan (1994) claimed that half of students enter the university unprepared to meet the demand of self-directedness. Kegan (1994) concluded that the goal of adult education should not be to train students to be self-directed. Rather, the goal should be to educate learners in such a way that that supports the order or thinking that enables learner self-direction.

The review of the literature base in personal epistemology uncovered several concepts pertinent to this study. Schommer's model of more or less independent epistemological beliefs proposed that multiple beliefs make up one's personal epistemology. These beliefs are more or less independent of one another and may not develop at the same rate. According to this theory, multiple beliefs about the structure of knowledge, the certainty of knowledge, the sources of knowledge, the control of learning, and the speed of knowledge acquisition make up one's personal epistemology, and these

beliefs may develop asynchronously and more or less independently or one another. These beliefs were measured by the SEQ (Schommer, 1989a).

According to Schommer's extensive research utilizing the SEQ, epistemological beliefs affect learners' comprehension, problem solving, study strategy, and reasoning skills (Schommer 1989a, 1993a, 1993b; Schommer et al., 1992; Schommer & Dunnell, 1994). Schommer also found that epistemological beliefs were similar across domains (Schommer & Walker, 1995), and beliefs developed over time (Schommer, 1994; Schommer et al., 1997). Additionally, Hofer and Pintrich (1997) pointed out in their review of existing developmental models that regardless of the number of stages, positions, or perspectives, the sequence invariably suggests movement from a dualistic, objectivist view of knowledge to a more subjective, relativistic stance and ultimately to a contextual, constructivist perspective of knowing (as cited in Hofer, 2002, p. 7).

The research question for this study, "Does a relationship exist between demographic factors, educational factors, learner epistemological beliefs, and learner perception of self-directedness?" was constructed from the literature discussed in this chapter. A detailed description of the methodology utilized in this study follows in Chapter 3.

CHAPTER 3

Introduction

This chapter includes an explanation of how the methodology for this research was selected. Information about the background for selection of instrumentation, the research questions, the methodology, the assumptions guiding the research, the participants in the study, the measures, the variables, the data collection procedure, and the data analysis are discussed.

Background

Researchers have conducted numerous inquiries in order to better understand the phenomenon of self-directed learning and the intricacies of personal epistemology. As indicated in previous chapters, the characteristics of self-directed learners have been defined in many ways: as a developmental stage (Knowles, 1980); as a combination of learning preferences, ownership, and responsibility (Brockett & Hiemstra, 1991); as related to learning style (Adenuga, 1991; Brookfield, 1986; Deroos, 1982; Pratt, 1984; Theil 1984); and as a combination of planning, making choices, exercising good judgment, reflecting, and exercising willpower and self-discipline (Candy 1991; Chene, 1983). These characteristics have been hypothesized by the phenomenological observations of prominent adult educators (Brookfield, 1985a; Candy, 1991; Knowles, 1980). Some qualitative research, such as semi-structured interviews, have been conducted to explore the process of self-directed learning (Tough 1971, 1973). The majority of the research on self-directed learning has been conducted through questionnaires, survey research, and other quantitative approaches (Adenuga, 1991; Deroos, 1982; Pratt, 1984; Theil, 1984). The SDLRS developed by Guglielmino in a

doctoral dissertation in 1977, has been the most-used instrument in self-directed learning research (Alspach, 1991; Anderson, 1994; Bitterman, 1989; Brockett, 1982, 1983, 1985; Box, 1983; Crook, 1985; Cunningham, 1989; Graeve, 1987; Guglielmino & Guglielmino, 1983; Hall-Johnson, 1985; Hassan, 1981; Johnson et al., 1988; Leeb, 1983; Long & Agyekum, 1988; Long & Cloud, 1997; McCarthy, 1985; Middlemiss, 1987; Moore, 1988; Murray, 1987; Palumbo, 1990; Reynolds, 1985; Russell, 1988; Rutland, 1987; Sabbaghian, 1979; Savoie, 1979; Skaggs, 1981; Torrance & Mourad, 1978; Wiley 1981, 1982; Winters & Long, 1997; Young, 1986;). Over 100 doctoral dissertations have been completed using the SDLRS (Appendix A).

The study of personal epistemology spans many disciplines including educational development, cognitive development, and educational psychology. The study of epistemological beliefs began with Perry (1968), and Perry's scheme of intellectual and ethical development has been the basis for numerous studies (Baxter Magolda, 1998, 2002; Belenky et al., 1986; King & Kitchener, 1994; Knefelkamp & Slepitza, 1978; Ryan, 1984; Schommer, 1990; Touchton et al., 1977). Perry's original scheme included both an interview schedule and a short survey instrument. Schommer (1990) drew on the work of Perry (1968), Schoenfeld (1983, 1985), Dweck and Leggett (1988), and Kitchener and King (1989) to develop the Epistemological Questionnaire (SEQ). The SEQ has been referenced in more than 20 studies (Jehng, Johnson, & Anderson, 1993; Mori, 1997; Schommer, 1989a, 1989b, 1990, 1993a, 1993b, 1994, 1998; Schommer et al., 1997; Schommer, et al., 1992; Schommer & Dunnell, 1994, 1997; Schommer & Walker, 1995, 1997; Schommer-Aikins, 2002, 2004; Schommer-Aikins et al., 2003; and Schraw, Bendixen, & Dunkle, 2002) and in 19 doctoral dissertations (Appendix B).

Research Questions

The research questions for this study emerged from an extensive review of the adult education, self-directed learning, cognitive development, and personal epistemology literature.

Primary Research Question

1. Does a relationship exist among demographic variables, educational variables, learner perception of self-directedness, and learner epistemological beliefs? If so, what is the nature of this relationship?

Secondary Research Questions

2. Is there a statistically significant relationship between learner perception of self-directedness as measured by the Self-Directed Learning Readiness Scale (SDLRS) and the demographic variables of age, gender, race, marital status, parents' education level, and rural or urban residence?
3. Is there a statistically significant relationship between learner perception of self-directedness as measured by the SDLRS and educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program?
4. Is there a statistically significant relationship between the factors outlined in the SDLRS—openness to learning opportunities; self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, positive orientation to the future, and ability to use basic study skills and problem-

solving skills—and the demographic variables of age, gender, race, marital status, parents' education level, and rural or urban residence?

5. Is there a statistically significant relationship between the factors outlined in the SDLRS—openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, positive orientation to the future, and ability to use basic study skills and problem-solving skills—and the educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program?
6. Is there a statistically significant relationship between the factors outlined in the Schommer Epistemological Questionnaire (SEQ)—the truth is clear and unambiguous, thinking for yourself is a waste of time, learning does not require effort, knowledge should come quick, and intelligence is static—and the demographic variables of age, gender, race, marital status, parents' education level, and rural or urban residence?
7. Is there a statistically significant relationship between the factors outlined in the SEQ—the truth is clear and unambiguous, thinking for yourself is a waste of time, learning does not require effort, knowledge should come quick, and intelligence is static—and the educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program?

8. Is there a statistically significant relationship between learner perception of self-directedness as measured by the SDLRS and learner epistemological beliefs as measured by the SEQ?
9. Is there a statistically significant relationship between the factors outlined in the SEQ—the truth is clear and unambiguous, thinking for yourself is a waste of time, learning does not require effort, knowledge should come quick, and intelligence is static—and the factors outlined in the SDLRS—openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, positive orientation to the future, and ability to use basic study skills and problem-solving skills?
10. Is learner perception of self-directed learning readiness as measured by the SDLRS predicted at a statistically significant level by learner epistemological beliefs as measured by the SEQ and by selected demographic and educational variables?

Methodology

The methodology for this research was derived from quantitative research traditions, particularly survey research. Alreck and Settle (1995) pointed out that survey research often is an "easier, less expensive or more accurate way to get the required information" (p. 3). Survey research is an ideal means of data collection when well established instruments that measure the desired data have already been developed and tested. The instruments selected for this study, the Self-Directed Learning Readiness

Scale (SDLRS) and Schommer's Epistemological Questionnaire (SEQ), were selected because of their substance and continued use over time.

Guglielmino (1977) developed the SDLRS as part of a doctoral dissertation. Since that time, the SDLRS has been utilized in over 100 doctoral dissertations (Appendix A) and administered to 40,000 adults and 5,000 children (Guglielmino & Associates, n.d., p. 1). Likewise, Schommer developed the SEQ as part of a doctoral dissertation, and this instrument has been referenced in 19 doctoral dissertations (Appendix B) and in more than 20 other studies. The Demographic and Educational Questionnaire items were derived from the literature base and from significant findings in previous studies of learner self-directedness and personal epistemology.

The selection of instruments for this study was based on the research questions. Of the two best-known instruments utilized to measure self-directedness, the Self-Directed Readiness Scale and the Oddi Continuing Learning Inventory (OCLI), the SDLRS was selected because of its prevalence and established history of use. The OCLI is a newer, less established instrument with limited use, and there have been many criticisms of the OCLI in the literature that remain unanswered (Landers, 1989; Six 1987). Landers (1989) pointed out that the internal reliability of the SDLRS is very strong while the OCLI is not as reliable. Landers (1989) concluded that the SDLRS is the instrument that should be utilized to measure self-direction in learning.

There were several choices of instruments for measuring epistemological beliefs including the Checklist of Educational Values (Perry, 1968), the Reflective Judgment Interview based on the Reflective Judgment Model (King & Kitchener, 1994), Epistemic Doubt Interview (Boyes & Chandler, 1992), the Measure of Epistemological Reflection

(Baxter Magolda & Porterfield, 1988; Taylor & Porterfield, 1983), Women's Ways of Knowing Interview (Belenky et al., 1986), Attitudes Toward Thinking and Learning Survey (Galotti, Clinchy, Ainsworth, Lavin, & Mansfield, 1999), Schommer Epistemological Questionnaire (Schommer, 1989), Jehng, et al.'s Beliefs about Knowledge and Learning (1993), and the Epistemological Belief Inventory (Schraw et al., 2002). A related instrument, the Learning Environment Preferences (LEP), was developed by Moore (1987, 1989). The LEP measures differences in intellectual and/or cognitive performance correlated to Perry's scheme of intellectual development. The Schommer (1989) instrument was selected because it best measured the variables described in the research questions, and it has parametric qualities at least equal to and sometimes exceeding the other instruments listed above. Additionally, the SEQ has an established record through its use in various studies.

Assumptions

1. Learners have identifiable conceptions and beliefs about the nature of knowledge.
2. These beliefs affect the learners' level of engagement in learning activities, approaches to learning tasks, and comprehension of material.
3. There are personal characteristics and behaviors which distinguish highly self-directed learners from learners who are less self-directed.
4. The participants in the study answered the survey questions honestly.
5. The sample is representative of the population of adult students at Friends University in Wichita, Kansas.

Participants

The population for this study was a sample taken from students at Friends University, a private, liberal arts college offering degrees to traditional undergraduate, adult, and graduate students through three separate colleges. The College of Adult and Professional Studies offers degree programs to adult students in Wichita, Kansas, Topeka, Kansas, Lenexa, Kansas, and other outreach locations throughout the state. The participants were adult students in the PACE (2 year associate's degree) or DCP (13-24 month cohort group bachelor of science degree) programs at the Friends University campus in Wichita, Kansas (N=394). The study took place during the 2004-2005 academic year beginning August 28, 2004 and ending May 12, 2005.

Measures

The measures used for this study were (a) the Self-directed Learning Readiness Scale (SDLRS) (Appendix C); (b) the Epistemological Questionnaire (SEQ) developed by Schommer (Appendix D); and (c) an instrument used to gather demographic and educational data (Appendix E).

Self-Directed Learning Readiness Scale

The SDLRS was designed to measure the attitudes, abilities, and characteristics that contribute to readiness to engage in self-directed learning. The SDLRS is a self-report instrument developed by Guglielmino for a doctoral dissertation at the University of Georgia. Fourteen authorities in the area of self-directed learning participated in a Delphi study to identify the characteristics which the SDLRS measures (Guglielmino & Associates, n.d., p.1). The 58-item instrument was administered to 307 participants in Georgia, Vermont, and Canada. The SDLRS yielded eight factors which loaded at .300 or

above. These factors include openness to learning opportunities (nine items with factor loadings ranging from .323 to .660), self-concept as an effective learner (nine items with factor loadings ranging from .311 to .671), initiative and independence in learning (nine items with factor loadings ranging from .353 to .572), informed acceptance of responsibility for one's own learning (10 items with factor loadings ranging from .320 to .625), love of learning (six items with factor loadings ranging from .318 to .597), creativity (seven items with factor loadings ranging from .312 to .608), positive orientation to the future (five items with factor loadings ranging from .389 to .676), and the ability to use basic study skills and problem solving skills (four items with factor loadings ranging from .377 to .689) (Guglielmino, 1977, pp. 62-69).

The SDLRS has been validated by several subsequent correlational studies. Torrance and Mourad (1978) found correlations between learner perception of self-directed readiness and three measures of originality, the ability to develop analogies, the ability to think creatively, and the right hemisphere style of learning. Sabbaghian's (1979) study found positive relationships between self-concept and perception of readiness for self-directed learning, self-concept, and seven of eight factors of the SDLRS. Sabbaghian also found correlations between self-image and self-directed readiness as well as class rank and SDLRS scores. Hassan (1981) found a significant positive relationship between the number of self-directed projects completed, SDLRS total scores, and seven of eight factor scores. Virtually all of the validity studies of the instrument utilized the 58-item scale. Early validation studies include those of Long and Agyekum (1988), Finestone (1984), Reynolds (1985) and Long (1987). Guglielmino

reported that “based on a 1988 compilation of 3151 respondents to the SDLRS, the Pearson split-half reliability estimate is .94” (Guglielmino & Associates, n.d., p. 1).

Another measure of validity is the internal reliability and consistency of the SDLRS. The internal consistency of the scale has raised many questions. Brockett and Hiemstra (1991) conducted an analysis of item-to-total correlations for the instrument. They found that 21% (12 of the 58 items) did not correlate significantly with the total scale. The concerns raised included reverse-items and confusing wording. Of the 12 items that did not correlate significantly with the total scale, 9 were from the 17 reverse worded and reverse-scored items. These items were written to be scored in reverse and were written using double-negatives. Likewise, Leeb’s (1983) study found that 11 of the items on the SDLRS did not correlate significantly with the total scale. Also, many of the respondents were confused by the wording of the scale. The items range from “Almost always true of me” to “I hardly ever feel this way” and “Almost always true of me” to “There are very few times I don’t feel this way.” Brockett (1985) pointed out that the education level of the sample can be associated with the degree of difficulty respondents had with the wording of the items.

These findings on the internal consistency of the SDLRS are challenged by those of other studies. In a 1984 content validation of the SDLRS, Finestone did not find significant differences on SDLRS scores based on the education level of the participants. Likewise, in 1989 Landers conducted a study comparing the SDLRS with the Oddi (1984) Continuing Learning Inventory (OCLI). Landers found that each of the eight factors of the SDLRS correlated significantly with the total score. Further, Landers found that only six of the 58 items were statistically weak. Landers concluded that the internal

reliability of the SDLRS was very high and that the SDLRS is the most appropriate instrument to use to measure learner self-direction. Other researchers confirmed this finding when they claimed that the SDLRS is the most important instrument to measure self direction in adult learning (Brockett & Hiemstra, 1991, p. 71). In Guglielmino's original investigation of the SDLRS, Guglielmino (1977) found a reliability coefficient of 0.87. This coefficient suggests that the SDLRS should be generalizable for use with populations similar to those in the initial study.

The strongest criticisms of the SDLRS came from Field (1989) who examined the structure, validity, and reliability of the SDLRS. Field administered the instrument to 244 students enrolled at the Institute of Technical and Adult Teacher Education in Sydney, Australia. Field found a reliability coefficient of 0.89, which was very close to previously reported figures (Brockett, 1985; Guglielmino, 1977; Guglielmino & Associates, n.d.). Field reported that the item-to-total correlations revealed that 12 items did not achieve a 0.3 correlation coefficient with the SDLRS total. Brockett and Hiemstra (1991) pointed out that three of the items "that did not correlate have been identified similarly in at least three other studies (Brockett, 1985; Leeb, 1983; Long, 1987), and two additional items were found not to correlate with total SDLRS score in both the Brockett and Leeb investigations" (p. 73).

Field raised four specific concerns about the SDLRS. First, Field questioned the Delphi technique utilized in the development of the instrument given the various definitions of "self-directed learning" in the literature base. Second, Field questioned the lack of definition of the terms "self-directed learner," and "readiness." Third, Field objected to the negatively phrased and reverse-scored items. Fourth, Field questioned the

instrument development process utilized by Guglielmino. In this process, the current 58-item scale was created when 9 of the original 41 items were eliminated and 26 new items were added. Field's conclusion was that the SDLRS is a seriously flawed instrument. Field (1989) wrote, "the problems inherent in the scale are so substantial that it should not continue to be used" (p. 138).

Field's criticisms provoked many responses in defense of the SDLRS. Guglielmino (1989) responded directly to the four criticisms outlined by Field (1989). Guglielmino suggested that the Delphi process was not used for the selection of individual items; rather, it was used to determine characteristics exhibited by self-directed learners. Likewise, Guglielmino pointed out that "self-directed learner" was defined by the participants in the Delphi process. Also, Guglielmino contended that "readiness" suggests that learner self-direction can be viewed as a continuum; at various stages of readiness learners can be placed at specific points on the continuum. Next, Guglielmino responded to the use of reverse-items. Guglielmino included these items to avoid the potential for "response set" where a participant stops reading the items carefully because he or she assumes all of the items will be similar. Guglielmino (1989) pointed out that "17 additional items were added after the initial field test, not 'after validation of the scale,' as stated by Field" (p. 238). Last, Guglielmino (1989) concluded that Field's report "is so filled with errors of omission and commission that it does not merit serious consideration" (p. 240). Two other investigations criticized Field's study. Long (1989) characterized Field's review of literature as weak; Long stated that Field omitted important references in the self-directed learning literature and often used quotations in ways that were "out of context" or "misleading" (p. 241). McCune (1989) focused on

problems with Field's statistical analysis including criticisms of Field's discussion of reliability, factor analysis, and reverse-scored items. McCune's criticism of Field's study centered on the use of a modified version of the SDLRS instead of the standard instrument.

The concerns about the SDLRS have been adequately addressed in the self-directed learning literature. The SDLRS has been widely utilized, and it has contributed to the knowledge base in the field of adult education. More than 100 doctoral dissertations have utilized the SDLRS (Appendix A), and over 200 studies have been conducted using this instrument. Over 40,000 adults have taken the SDLRS, and the SDLRS has been used by more than 500 organizations world-wide (Guglielmino & Associates, n.d.). Despite the controversy about the SDLRS, it remains the most reliable and valid instrument for measuring the readiness of self-directed learners.

Schommer Epistemological Questionnaire

The Schommer Epistemological Questionnaire (SEQ) was developed as part of Schommer's (1989a) doctoral dissertation. The SEQ is a 63-item instrument designed to measure epistemological beliefs. The questionnaire is composed of statements that participants rate on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). There are twelve subsets of items used as variables in factor analysis. These subsets have produced four significant factors: fixed ability (two subsets with factor loadings ranging from .430 to .768), simple knowledge (four subsets with factor loadings ranging from .293 to .356), quick learning (one subset with factor loadings ranging from .665 to .729), and certain knowledge (one subset with factor loadings ranging from .428 to .576). Generally, two or more subsets of items measure the epistemological factors. For

example, learners can oversimplify information by focusing on single answers, avoiding integration of material, or avoiding ambiguity. The four-factor structure has been replicated in several studies including Bendixen, Dunkle, and Schraw (1994), Dunkle, Schraw, and Bendixen (1993), Paulsen and Wells (1998), Schommer (1993a, 1993b), Schommer and Dunnell (1994, 1997), and Schommer et al. (1992).

One measure of the content validity of the SEQ is that it was screened by professionals in the field of educational psychology (Duell & Schommer-Aikins, 2001). Another measure is the SEQ's predictive validity. The structure of knowledge factor has predicted comprehension in reading and understanding texts while the speed of learning factor has predicted comprehension monitoring and grade point average. The ability to learn factor has predicted how participants value education, and the stability of knowledge factor has predicted interpretation of tentative information. Last, confirmatory factor analysis using the mean score of subsets of items as the variables in the analysis replicated the four-factor structure (Schommer et. al., 1992).

Another measure of validity is the internal reliability and consistency of the SEQ. For middle school students, the inter-item correlations for items within each belief factor ranged from .55 to .70. For high school students, inter-item correlations within each belief factor ranged from .51 to .78. For college students, the test-retest score is .74 while the inter-item correlations for items within each belief factor ranged from .63 to .85 (Duell & Schommer-Aikins, 2001).

The SEQ has been used in various ways. Some researchers have used the instrument as a predictor (Hall, Chiarello, & Edmondson, 1996; Windschitl & Andre, 1998) while others have used it as a basis to develop a customized epistemological

instrument (Cole, Goetz, & Wilson, 2000; Jehng et al., 1993). Still others have used it as a springboard to develop their own measures (Hofer and Pintrich, 2002; Schraw et al., 2002; Wood & Kardash, 2002). The predictive validity of the instrument has been established by several findings where three of the four beliefs have predicted comprehension, test performance, and quality of summarizing and reaching conclusions (Schommer 1990). Belief in certain knowledge predicted interpretation of tentative information (Schommer, 1990). In addition, belief in simple knowledge predicted comprehension and comprehension monitoring of mathematical passages (Schommer et al., 1992).

Later findings suggested that a negative correlation existed between the belief in fixed ability to learn at birth and resistance to school (Schommer & Walker, 1997); similarly, a negative correlation was found between belief in fixed ability and persistence in the face of a difficult academic task; this finding confirmed the findings of earlier research (Dweck & Leggett, 1988). Other studies indicated that the more students believed that knowledge is isolated and organized in bits and pieces, the more likely the students were to overestimate comprehension and oversimplify complex ideas (diSessa, 1988; Songer & Linn, 1991; Spiro, Coulson, Feltovich, & Anderson, 1988). The higher the extent to which students believed in quick learning, the less likely they were to devote time to problem solving, confirming the findings of Schoenfeld (1983, 1985); similarly, the more students believed it quick learning, the more likely they were to earn low grade point averages (Schommer, 1993b). Last, the more that student believed that knowledge is certain, the more likely they were to misinterpreted tentative information as absolute truth (Schommer, 1990; Schommer & Dunnell, 1997).

Criticisms of the SEQ have focused on the difficulties of using a translated version of the instrument (Clarebout et al., 2001) and have included a critique of the factors in the SEQ. Hofer and Pintrich (1997) pointed out that generally Schommer only reports factor scores from the 12 subsets rather than from a factor analysis of the individual items, and that only two factors, "quick learning" and "certain knowledge," have loaded consistently across different populations.

In response to criticisms of the SEQ, Schraw et al. (2002) developed and validated the Epistemological Beliefs Inventory (EBI). The EBI was tested against Schommer's instrument. Schraw et al. (2002) found that the two instruments "differ with respect to the number of factors they yield and the degree to which these factors match theoretical predictions," and "differences exist with respect to the proportion of sample variance explained by the two instruments" (p. 271). Other findings suggest that the EBI had better predictive validity than the SEQ, and the EBI had better test-retest reliability than the SEQ (p. 271). However, Schraw et al. cautioned that the EBI is so new that the initial findings should be considered tentative, and researchers should continue to use the SEQ along with the EBI until further validation research on the EBI is completed.

The SEQ is a strong instrument and should continue to be used to assess epistemological beliefs. Even though there are criticisms of the SEQ and another instrument has been developed, the advantages of the instrument outweigh its limitations. The SEQ has been utilized for 15 years, and it has been validated by several studies, including 19 doctoral dissertations (Appendix B) and 20 other studies. The validity of the SEQ is "reflected in that responses to this questionnaire has been found to predict comprehension, metacognition, interpretation of information, and integration of

information" (Schommer, 1990; Schommer et al., 1992; Schommer, 1993a, p. 360). Further, the eight-week test-retest reliability based on a "sample of students taking a learning theory class is .70" (Schommer, 1993a, p. 360). This is a relatively high correlation when one considers that students enrolled in the class would likely grow in their epistemological beliefs as they increased their knowledge of learning theories. The SEQ is also appealing because of its efficiency as it can be administered and scored in a reasonable amount of time. The SEQ is based on a unique approach to epistemological beliefs, and this multidimensional approach allows researchers to more easily search for relationships between epistemological beliefs and other factors.

Dependent Variables

The dependent variables include Self-Directed Learning Readiness Scale (SDLRS) total and factor scores and Schommer's Epistemological Questionnaire (SEQ) factor scores.

Independent Variables

The independent variables were selected based on previous findings in the self-directed learning, personal epistemology, and cognitive development literatures. The independent variables include the demographic variables of age (Brockett & Heimstra, 1991; Cross, 1981; Houle, 1961, 1993; Hiemstra, 1976; Kegan, 1994; Knowles, 1986; Leith, 1997; Long & Agyekum, 1988; Long & Morris, 1996; McCarthy, 1985; Merriam & Brockett, 1997; Schommer, 1989b, 1993b, 1994, 1998; Schommer & Dunnell, 1994, 1997; Tough, 1973), gender (Baxter Magolda, 1992, 1998; Belenky et al. 1986; Goldberger, 1996; Hammond & Collins, 1991; Schommer, 1990, 1994; Tough, 1973;), race (Brookfield, 1984; 1985b, 1988; Hammond & Collins, 1991; Long & Agyekum,

1988; Schommer, 1994), marital status (Hammond & Collins, 1991; Schommer, 1994; Tough, 1973), educational level of mother and father (Guglielmino & Guglielmino, 1983; Hammond & Collins, 1991; Schommer, 1993a, 1994; Schommer & Walker, 1997), and rural or urban residence (Bejot, 1981; Hammond & Collins, 1991; Peters & Gordon, 1974; Schommer 1994; Tough, 1973). They also include the educational variables of class standing (Katherein, 1981; Moore, 1988; Murray, 1987; Perry, 1968; Richards, 1986; Sabbaghian, 1979; Schommer 1989a, 1990, 1993a, 1994; Schommer & Walker, 1997), grade point average (Box, 1983; Moore, 1988; Murray, 1987; Sabbaghian, 1979; Savoie, 1979; Schommer 1993a, 1993b; Schommer & Walker, 1997), major field of study (Danis, 1992; Grow, 1991; Schommer et al., 1992; Schommer & Walker, 1995; Schommer-Aikins et al., 2003), exposure to the liberal arts (Danis, 1992; Davidson & Goldberg, 2004; Grow, 1991; Kegan, 1994; Kintz, 1999; Schommer, 1994), exposure to self-directed learning (Caffarella, 1982, 1983; Kasworm 1982, 1983; Kegan, 1994; Schommer 1994), exposure to experiential learning (CAEL, 2004; Jarvis, 1995; Kegan, 1994; Kolb & Fry, 1975; Murray, 1987; Schommer 1994), and type of program (Box, 1983; Caffarella, 1982, 1983; Kasworm 1982, 1983; Schommer 1993a, 1994; Schommer & Dunnell, 1997).

Dependent Variables and Independent Variables Used in the Regression Analysis

For the regression analysis, the SDLRS total scores were the dependent variables, and the demographic and educational variables significant at the $p<.002$ level and the significant SEQ factors scores were the independent variables.

Data Collection Procedure

The research instruments were administered online to selected courses during the regularly scheduled class time. The sample included both PACE and DCP courses at Friends University. The course instructors were informed of the research project by letters sent by Dr. Sean Warner, Dean of the College of Adult and Professional Studies (Appendix F), and the investigator (Appendix G) approximately one week before the scheduled class visits. The course instructors were invited to contact either Dr. Warner or the investigator if the scheduled class visit presented a problem.

The surveys were administered by several trained research assistants. The research assistants followed a strict survey protocol (Appendix H). During each survey, the research assistant arrived at the regularly scheduled classroom and explained the research project to the participants by reading the following paragraph:

> The College of Adult and Professional Studies is seeking input from students to find out how we can best serve your needs. The research project that you are about to participate in will help us gather information that we can use to make decisions about future class offerings, the structure of our programs, and the delivery of our programs . . . . (p. 2)

Then, the research assistant distributed and explained the Informed Consent forms (Appendix I) to the potential participants. Next, the assistant read the following paragraph to the participants:

> Please read this form. We appreciate your participation in this research. Each person who completes the survey has the opportunity to be entered in a drawing to win $100.00. The data gathered in this study is confidential. The Institutional

> Research Board at Kansas State University and the College of Adult and Professional Studies at Friends University have determined that this study poses no risk to participants. Students are only allowed to participate in this research once. If you have already taken this survey, please do not participate in this study a second time. (p. 2)

After the participants signed the informed consent forms, the research assistant gave one copy of the form to the participants and kept the other copy for the records of this research. The class was then taken to a computer lab where the instrument was sent to each participant's Friends University email address (Appendix J). The research assistant guided the participants through the sign-in process, including giving the participants the survey password, reading the survey instructions, and asking the participants to complete the survey. When the entire class finished the survey, the research assistant accompanied the participants back to their regularly scheduled classroom. A similar protocol was developed to survey students enrolled in online hybrid courses. For these courses, the instructor administered the surveys according to the protocol. In addition to the opportunity to enter the $100.00 drawing, online hybrid students were offered five extra credit points in their courses as an incentive to complete the survey. The survey was only available on selected dates and times; this method of administration simulated the protocol for the traditionally scheduled classes.

Data Analysis Procedure

First, the results from the Demographic and Educational Questionnaire were examined for measures of central tendency and dispersion. The descriptive statistics were used to characterize how the sample was distributed across the demographic variables of

age, gender, race, marital status, parents' education level, and rural or urban residence, and the educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program.

Descriptive statistics from SDLRS were examined. The eight factor structure was described, and the descriptive data for the total and factor scores were analyzed for measures of central tendency and dispersion. Then, the SEQ factor scores were examined. The data were analyzed using Schommer's four factor solution. Next, an independent factor analysis revealed five factors from Schommer's instrument for this population. The five factor structure was examined, and the descriptive data of the factor scores were analyzed for measures of central tendency and dispersion.

The next stage of the statistical analysis focused on research questions dealing with correlations of demographic and educational variables with SDLRS total and factor scores. The SDLRS total and factor scores were examined as a function of the demographic and educational variables of age, gender, race, marital status, parents' education level, rural or urban residence, class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program.

This process was repeated for the research questions inquiring about the correlations of demographic and educational variables and SDLRS total scores. The factor scores of the SEQ were examined as a function of the demographic and educational variables of age, gender, race, marital status, parents' education level, rural or urban residence, class standing, grade point average, major field of study, exposure to the

liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program.

The next stage of analysis focused on correlating SEQ factor scores with SDLRS total and factor scores. Last, a regression analysis of the SDLRS scores as a function of the SEQ factors followed. Selected significant demographic, educational, and SEQ factors were utilized in a regression analysis to predict learner perception of self-directedness.

Summary

This research investigating the relationship between demographic and educational variables, learner perception of self-directed readiness, and learner epistemological beliefs was derived from quantitative research traditions which offered the most expedient and accurate means to gather the data for this study. Participants in the study were a sample taken from adult students who were enrolled in the PACE or DCP programs at Friends University. The surveys were administered online during regularly scheduled courses and online during hybrid courses.

The instruments utilized in this study were a demographic and educational questionnaire, the SDLRS, and the SEQ. The SDLRS and the SEQ were selected because of their continued use over time. The total and factor scores of the SDLRS and the SEQ generated the dependent variables, and the independent variables of age, gender, marital status, socio-economic status, education level of mother and father, urban or rural residence, class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program were measured by the demographic and educational questionnaire. The data

collected from the instruments were analyzed using appropriate descriptive and inferential statistics. A detailed discussion of the findings follows in Chapter 4.

CHAPTER 4

Introduction

This chapter includes a report on the findings of this research. Reviewed in this chapter are an overview of the study, the data collection procedures, and the dependent and independent variables. The findings for each research question are reported through descriptive analysis, factor analysis, correlation, or regression.

Overview of the Study

This study investigated the relationship between demographic and educational variables as measured by the Demographic and Educational Questionnaire, learner perception of self-directed readiness as measured by the Self-directed Learning Readiness Scale (SDLRS), and learner epistemological beliefs as measured by Schommer's Epistemological Questionnaire (SEQ). The population (N=394) consisted of students enrolled during the spring 2005 semester in the two year associate's degree in general studies program (PACE) and in the cohort-based bachelors degree completion programs (DCP programs) at the Wichita campus of Friends University.

Data Collection Procedure

The majority of the surveys were administered online during regularly scheduled PACE and DCP courses at Friends University between February 1, 2005 and March 3, 2005. Approximately one week before the surveys were scheduled to be administered, the course instructors received a letter (Appendix F) from Dr. Sean Warner, Dean of the College of Adult and Professional Studies, describing the research project. Approximately one day later, the instructors received an additional letter (Appendix G) from the investigator confirming the scheduled class visit. The instructors were invited to

contact either Dr. Warner or the investigator if the survey created an inconvenience or a disruption to the class schedule.

Trained research assistants administered the survey following a set protocol (Appendix H). The research assistants distributed and explained the informed consent forms and announced that each participant in the study had the opportunity to be entered into a drawing to win $100.00. If students chose to participate in the study, they signed two copies of the informed consent form (Appendix I). The participants kept one copy of the form for their records, and the research assistants collected the additional copy. After the informed consent forms were signed and collected, the research assistants accompanied the participants to a computer lab. In the computer lab, the research assistants read survey directions and instructed the students to open an email message with a hyperlink directing them to the survey (Appendix J). After listening to the instructions and receiving the survey password, the participants completed the survey. A similar protocol was developed and implemented for students taking online hybrid courses. In these courses, the classroom teachers conducted the survey protocol through Blackboard, a password protected course management system. Due to limited classroom seat time in the hybrid courses, the students completed the survey outside of class. In addition to the opportunity to enter the $100.00 drawing, these students were offered five extra credit points in their courses as an incentive for completing the survey. To simulate the in-class offering, the survey was available to the online hybrid students only during scheduled dates and times.

The survey was hosted on Survey Monkey, a password-protected online survey subscription service. Each course was assigned a separate survey and password. About 30

minutes before the survey was scheduled to be administered, an email message containing a hyperlink to the survey was sent to all students enrolled in the course that was surveyed. After the survey was administered, the informed consent forms were returned to the investigator and stored in a filing cabinet in the investigator's office.

As responses to the survey were received, the investigator downloaded the data from each class into a spreadsheet where the raw data were stored. The survey data were downloaded daily and were stored on the investigator's network drive. The data from each class were cut and pasted into another spreadsheet formatted for direct import into statistical software. In this spreadsheet, the respondents were assigned a participant number. Back up copies of all data were kept in a file drawer in the investigator's office.

The names and email addresses of participants who chose to enter the $100.00 drawing were entered into another spreadsheet. The drawing took place on April 5th, 2005 (Appendix K), and all participants who chose to enter the drawing were sent a thank you email message and were notified of the name of the $100.00 prize winner (Appendix L).

Dependent Variables

The dependent variables include Self-Directed Learning Readiness Scale (SDLRS) total and factor scores and Schommer's Epistemological Questionnaire (SEQ) factor scores.

Independent Variables

The independent variables were selected based on previous findings in the self-directed learning, personal epistemology, and cognitive development literatures. The independent variables include the demographic variables of age, gender, race, marital status, educational level of mother and father, and rural or urban residence. They also

include the educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program.

Dependent Variables and Independent Variables Used in the Regression Analysis

For the regression analysis, the SDLRS total scores were the dependent variables, and the demographic and educational variables and the SEQ factors scores were the independent variables.

Descriptive Analysis of the Sample

There were 653 students enrolled in the 43 courses surveyed. Twenty three of the classes surveyed were PACE classes, and 20 of the courses surveyed were DCP classes. Due to an unusually arduous cold and flu season and other confounding variables, there was an absentee rate of 131 students, which accounted for 22.09% of the sample during the time that the surveys were administered. Because of the high absentee rate, the investigator expanded the originally planned research schedule from 34 to 43 classes, including the addition of the online hybrid courses. As Table 4 indicates, over the course of the data collection process, there were 89 students who were ineligible to be surveyed because they had previously taken the survey in another class. A valid estimate of the return rate reflects the number of unduplicated students who completed the survey when it was presented.

There were 433 eligible and present students in the sample; the overall return rate from the sample was very high. Only thirty-nine students declined to complete the survey. The online hybrid return rate was lower than the in-class return rate. Nearly 76%

of the eligible students enrolled in online hybrid courses completed the survey while 92.08% of students completed the survey during regularly-scheduled traditional classes. The overall return rate for the survey was 90.99% (N=394).

Table 4
Survey Return Rate

	Number Enrolled in Classes Surveyed	Students Absent at Time of Survey	Participants Previously Surveyed	Possible Participants Present and Eligible to be Surveyed	Students Who Declined to Participate	N	Return Rate Percent
Enrolled in all Courses	653 (100%)	131	89	433	39	394	90.99
Enrolled in Trad. Courses	593 (90.8%)	131	58	404	32	372	92.07
Enrolled in Hybrid Courses	60 (9.2%)	0	31	29	7	22	75.86

Demographic Characteristics of the Sample

The age profile of the sample is shown in Table 5. The majority of the sample was under forty years old. Fifty one percent were between the ages of 24 and 35 years old. A relatively small proportion of the sample was younger (5.3%), while larger fractions (6.3% to 7.6%) extended up to 48-50 years of age. This distribution arose because both programs have admissions requirements that state that the students must be 25 years of age or older for program entry. The 5.3% responders who were under age 24 were approved exceptions to the age requirement.

Table 5
Frequency Distributions of Age Across the Sample

	Frequency	Percent
21-23	21	5.3
24-26	53	13.4
27-29	46	11.6
30-32	57	14.4
33-35	47	11.9
36-38	29	7.4
39-41	30	7.6
42-44	30	7.6
45-47	30	7.6
48-50	25	6.3
51-53	14	3.5
54-56	5	1.3
60 or older	7	1.8
Missing	1	0.3

The ethnic profile of the sample reflected the demographic make-up of Friends University. The sample was composed of 74.9% Caucasian participants, 13.2% African American participants, and 6.3% Hispanic participants. Other ethnic and racial groups made up the remaining 5.6% of the sample (Appendix N). The majority of individuals in the sample were married: 58.1% reported they were married, 21.6% reported they were single, and 16.5% reported they were divorced. Other living situations, such as domestic partnerships, made up the remaining 3.8% (Appendix O).

As shown in Table 6, the sample was primarily composed of first-generation college students. For 67.9% of the sample, the father's highest education level completed was high school. Likewise, for 69.3% of the sample, high school was the highest level of education completed by the mother. In general, mothers received a larger portion of associate degrees, but fathers received a larger proportion of bachelors and graduate degrees.

Table 6
Frequency Distributions of Education Level Across the Sample

	Father's Education Level Frequency	Father's Education Level Percent	Mother's Education Level Frequency	Mother's Education Level Percent
Elementary School	9	2.3	6	1.5
Middle School	44	11.2	34	8.6
High School	215	54.4	234	59.2
Associates Degree	46	11.6	60	15.2
Bachelors Degree	44	11.1	35	8.9
Graduate Degree	34	8.6	19	4.8
Missing	3	0.8	7	1.8

The sample was made up of 161 (41%) male and 232 (59%) female participants. Residents from a rural area composed 19.1% of the sample while 80.9% of the sample resided in an urban area (Appendix P). In general, the respondent was most likely

between the ages of 25-35, Caucasian, married, a first generation college student, female, and from an urban area.

Educational Characteristics of the Sample

The educational variable of class standing was distributed fairly evenly across the sample. Freshmen were 17.5% of those surveyed, 24.1% were sophomores, 35.5% were juniors, and 23.3% were seniors (see Table 7).

Table 7
Frequency Distributions of Class Standing Across the Sample

	Frequency	Percent
Freshman	69	17.5
Sophomore	95	24.1
Junior	139	35.3
Senior	88	22.3
Doctoral	1	.3
Missing	2	.5

The grade point averages of the participants were distributed unevenly across the sample. The largest portion of the sample (44.9%) reported a cumulative grade point average of 3.6 and above while 28.8% of the sample reported a grade point average between 3.2 and 3.5. This large percentage of respondents reporting an "A" average (44.9%) and the large percentage reporting cumulative grade point averages of 3.2 and above (73.4%) suggest that Friends University, like many other educational institutions across the country, may have problems with grade inflation. A grade point average of 2.8 to 3.1 was reported by 16.1% of the sample, and 7.1% and 3.1% of the sample reported cumulative grade point averages of 2.4 to 2.7 and 2.3 or below respectively (see Table 8).

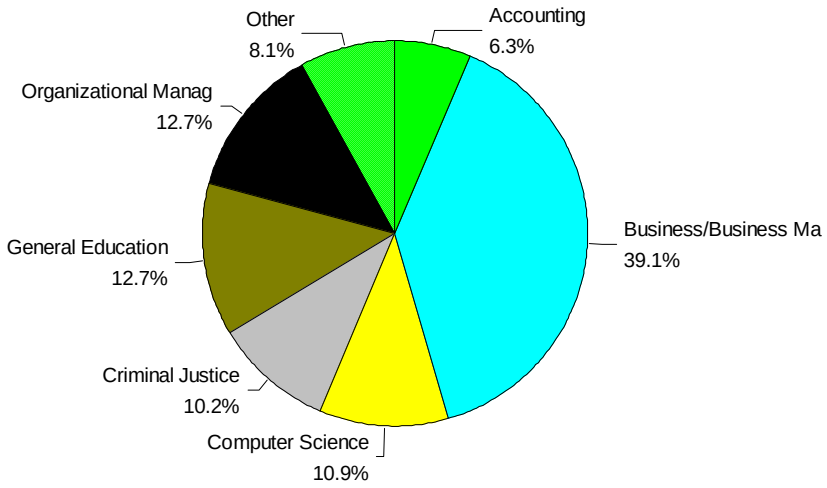
Table 8
Frequency Distributions of Grade Point Average Across the Sample

	Frequency	Percent
3.6 and above	176	44.7
3.2-3.5	113	28.7
2.8-3.1	63	16.0
2.4-2.7	28	7.1
2.3 or below	12	3.0
Missing	2	.5

As shown in Figure 2, the majority of the participants in the study, 39.1%, reported business management as their major field of study.

Figure 2
Major Field of Study

Figure 2: Major field of study (in percentage).



Two other major fields of study, general education and organizational management and leadership, each accounted for 12.7% of the sample while computer science was 10.9% and criminal justice was 10.2% of the sample. Other majors, such as religion and philosophy, marketing, human services psychology, human services sociology, health and physical education, education, English, eCommerce management, accounting, art, and biology, accounted for the remaining 14.4% of the sample.

As shown in Table 9, most of the students in the sample (92.4%) reported completing at least one course in the humanities. A similar number (91.6%) reported completing at least one course in the social sciences. In general, the respondents completed between 4 and 13 credit hours in the humanities and in the social sciences. In the social sciences, more than half of the sample had completed either 4-6 credit hours or 7-9 credit hours in this field. By contrast, the respondents were spread fairly evenly across the three categories of 4-6 credits, 7-9 credits, and 10-13 credits in the humanities, with the largest percentage (29.9%) reporting having taken 14 or more credits.

Table 9
Frequency Distributions of Credits Across the Sample

	Humanities Credits	Humanities Credits Percent	Social Science Credits	Social Science Credits Percent
0	30	7.6	30	7.6
1-3	24	6.1	37	9.4
4-6	66	16.8	121	30.7
7-9	72	18.3	102	25.9
10-13	84	21.3	64	16.2
14 or more	118	29.9	37	9.4
Missing			3	.8

As shown in Table 10, the majority of the sample reported limited access to self-directed learning activities or to experiential learning opportunities. A large percentage reported they have earned no credits through directed or independent studies (71.1%) or through experiential learning (74.6%). A small percentage of the sample reported earning 1-3 credits through directed or independent studies (11.7%,) or through experiential learning (12.4%), while the remaining percentage of the sample reported earning four or more credits through independent or directed studies (17.2%) or through experiential learning (12.7%).

Table 10
Frequency Distributions of Directed or Independent Study Credits and of Experiential Learning Credits Earned Across the Sample

Directed or Independent Study Credits			Experiential Learning Credits	
	Frequency	Percent	Frequency	Percent
0	280	71.1	294	74.6
1-3	45	11.7	49	12.4
4-6	28	7.1	20	5.1
7-9	12	3.0	9	2.3
10-13	9	2.3	6	1.5
14 or more	19	4.8	15	3.8
Missing			1	.3

Likewise, the majority of the sample reported limited access to self-directed learning activities through the use of a learning contract. As shown in Table 11, most (56.7%) reported having no exposure to utilizing a learning contract. Seventeen percent of the sample reported utilizing a learning contract once, 13.2% reported using a learning contract twice, 6.9% reported using a learning contract three times, and 5.3% reported

utilizing a learning contract 5 or more times during their college career. The remaining .5% of the sample reported utilizing a learning contract 4 times.

Table 11
Frequency Distributions of Learning Contract Use Across the Sample

Learning Contract Use	Frequency	Percent
0	224	56.7
1	67	17
2	52	13.2
3	27	6.8
4	2	0.5
5 or more	21	5.3
Missing	2	0.5

The type of program, cohort or non-cohort, was fairly evenly distributed across the sample. Two hundred and nineteen participants, 55.6%, reported participating in a cohort-based program while 175 participants, 44.4%, reported participating in a non-cohort program (Appendix Q).

In general, respondents were evenly spread across the four class standings: freshmen, sophomore, junior, and senior. Nearly seventy five percent had grade point averages of 3.2 or higher. Six major fields made up 91.9 percent of the sample, with business management accounting for 39.1%. Other fields accounted for at least 10% of the responses including organizational management and leadership, general education, computer science, and criminal justice. The majority of the sample reported completing one or more courses in the humanities (92.4%) and in the social sciences (92.4%). Most of the sample (86.3%) reported completing 4 or more credit hours in the humanities while

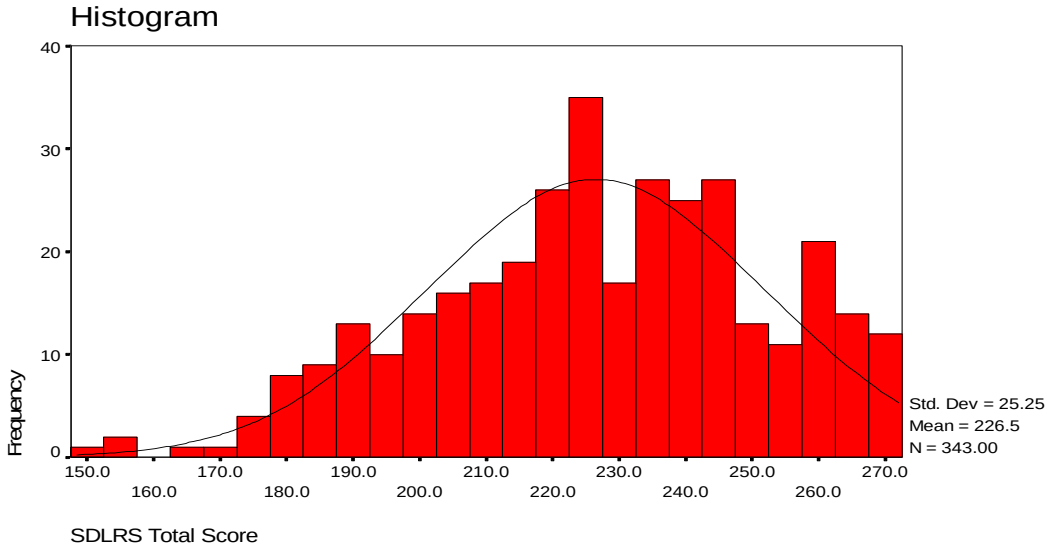
82.2% of the sample reported completing 4 or more credit hours in the social sciences. The majority of the sample reported having no exposure to self-directed learning via credits earned through directed or independent studies (71.1%), utilizing a learning contract (56.7%), or credit earned via experiential learning (74.6%).

Descriptive Analysis of the Self-Directed Learning Readiness Scale

The Self-Directed Learning Readiness Scale (SDLRS) was developed in 1977 as part of Guglielmino's doctoral dissertation. The SDLRS is a 58-item instrument designed to measure the attitudes, abilities, and characteristics that contribute to readiness to engage in self-directed learning activities. The SDLRS includes eight factors: openness to learning opportunities (nine items with factor loadings ranging from .323 to .660), self-concept as an effective learner (nine items with factor loadings ranging from .311 to .671), initiative and independence in learning (nine items with factor loadings ranging from .353 to .572), informed acceptance of responsibility for one's own learning (10 items with factor loadings ranging from .320 to .625), love of learning (six items with factor loadings ranging from .318 to .597), creativity (seven items with factor loadings ranging from .312 to .608), positive orientation to the future (five items with factor loadings ranging from .389 to .676), and the ability to use basic study skills and problem solving skills (four items with factor loadings ranging from .377 to .689) (Guglielmino, 1977, pp. 62-69).

The 394 surveys administered yielded 343 valid SDLRS total scores. Fifty two questionnaires were not scored due to missing items. As the frequency table in Appendix R indicates, the range of SDLRS total scores was 151 to 272. Figure 3 provides a histogram of the total scores.

Figure 3
Frequency Distribution of *SDLRS Total Scores*



The Cronbach's alpha for the SDLRS for this sample was .95. The Cronbach's alpha for each factor ranged from a low of .47 (factor 5) to a high of .74 (factors 1, 2, and 4). The inter-item correlations ranged between .05. and .42 for factor 1, between .16 and .46 for factor 2, between .24 and .32 for factor 3, between .02 and .60 for factor 4, between .03 and .32 for factor 5, between .02 and .35 for factor 6, between .03 and .35 for factor 7, and between .03 and .28 for factor 8.

The SDLRS factor scores, the range of scores in the sample, the mean, and the standard deviation for each factor of the sample are listed in Table 12. The mean of the SDLRS total score for the sample was 226.49 with a standard deviation of 25.25. Based on a 1988 compilation of 3151 respondents, Guglielmino and Associates (n.d.) reported that the mean SDLRS score for all adults was 214, and the standard deviation was 25.59. According to Guglielmino and Associates (n.d.), SDLRS scores are generally interpreted in ranges. Low readiness for self-directed learning includes scores that range from 58-

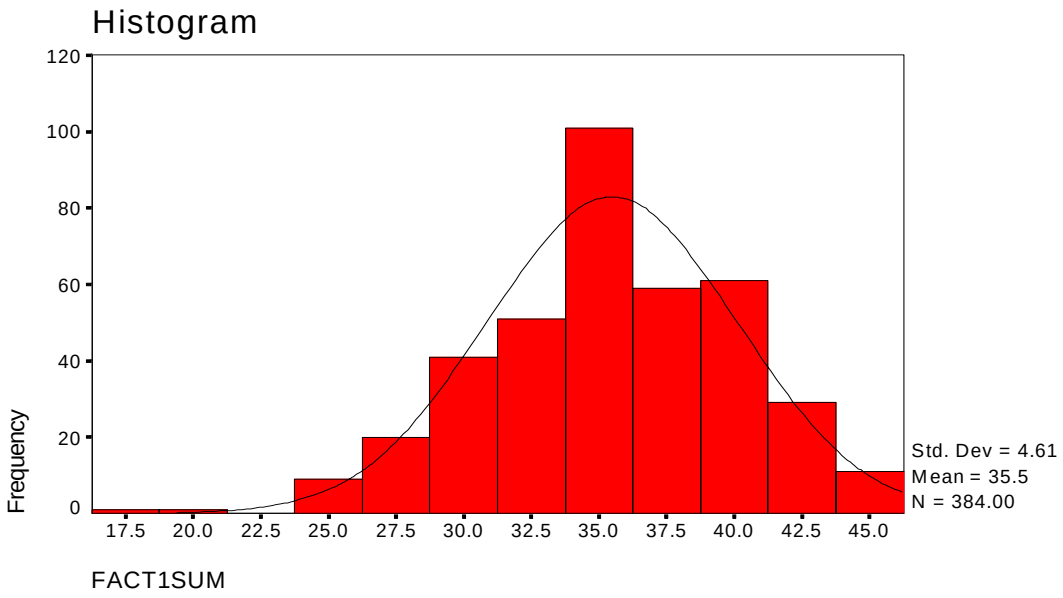
176, below average readiness scores range from 177-201, average readiness scores range from 202-226, above average readiness scores range from 227-251, and high scores range from 252-290. The mean score from the sample for this study is the highest score in the average range, 226.49. This mean score is almost one half of one standard deviation higher than the adult group in the Guglielmino and Associates compilation. Figure 3 illustrates the distribution of mean scores across the sample.

Table 12
Summary Statistics for SDLRS Factor Scores

Factor	Possible Range	Range of Scores	Average Item Score	Mean	Standard Deviation
Factor 1: Openness to Learning Opportunities	9 - 45	18-45	3.04	35.50	4.61
Factor 2: Self-concept as an Effective Learner	9-45	22-45	3.90	35.15	4.68
Factor 3: Initiative and Independence in Learning	9-45	21-45	3.87	34.88	4.39
Factor 4: Informed Acceptance of Responsibility for One's Own Learning	10-50	24-49	3.84	38.38	4.81
Factor 5: Love of Learning	6-30	13-30	3.69	22.13	2.93
Factor 6: Creativity	7-35	14-34	3.53	24.70	3.53
Factor 7: Positive Orientation to the Future	5-25	11-25	3.76	18.78	3.03
Factor 8: Ability to Use Basic Study Skills and Problem-Solving Skills	4-20	8-20	3.70	14.79	2.44

SDLRS factor 1, openness to learning opportunities, had a range of possible scores from 9 to 45. There were 384 valid responses to this item (Appendix S). As shown in Table 12, the actual range of scores on this factor was 18 to 45. The mean score for the sample on factor one was 35.5, and the standard deviation was 4.61. Figure 4 presents the distribution of scores for factor 1.

Figure 4
Frequency Distribution for SDLRS Factor 1 Scores



The distribution of scores for SDLRS factor 2, self-concept as an effective learner, had a range of possible scores from 9 to 45. There were 385 valid responses to this item (Appendix T). As shown in Table 12, the actual range of scores on this factor was 22 to 45. The mean score for the sample on factor one was 35.15, and the standard deviation was 4.68. Figure 5 presents a histogram for SDLRS factor 2 scores.

The distribution of scores for SDLRS factor 3, initiative and independence in learning, had a range of possible scores from 9 to 45 (Figure 6). There were 390 valid responses to this item (Appendix U). As shown in Table 12, the actual range of scores on

this factor was 21 to 45. The mean score for the sample on factor one was 34.88, and the standard deviation was 4.39.

Figure 5
Frequency Distribution for SDLRS Factor 2 Scores

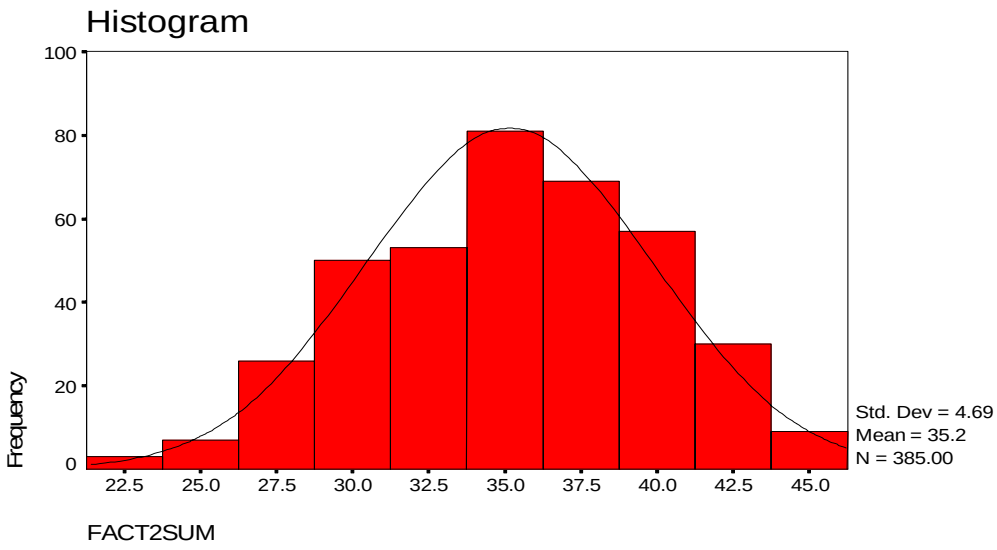
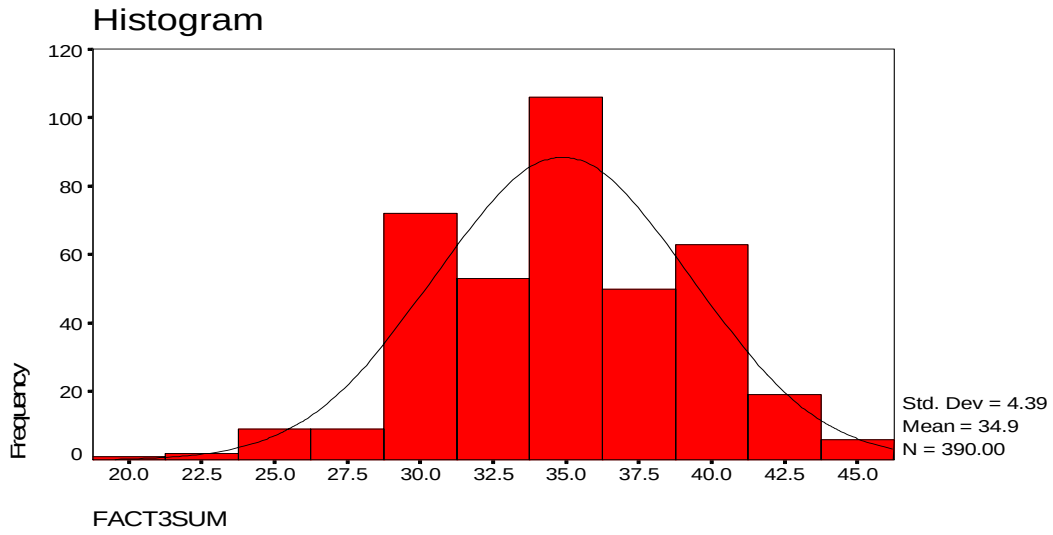
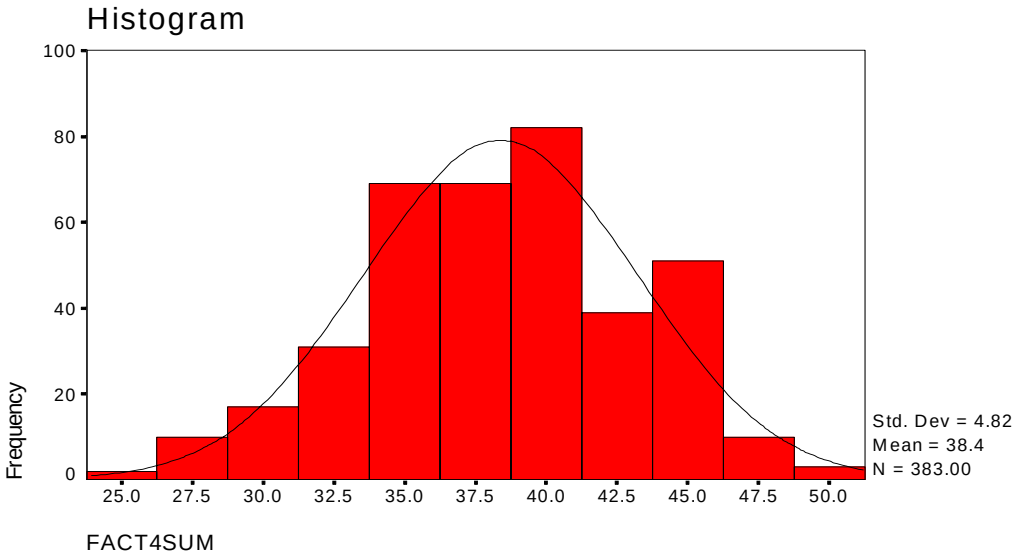


Figure 6
Frequency Distribution for SDLRS Factor 3 Scores



SDLRS factor 4, informed acceptance of responsibility for one's own learning, had a range of possible scores from 10 to 50. There were 383 valid responses to this item (Appendix V). As shown in Table 12, the actual range of scores on this factor was 24 to 49. The mean score for the sample on factor one was 38.38, and the standard deviation was 4.81. A histogram of the frequency distribution for factor 4 follows in Figure 7.

Figure 7
Frequency Distribution for SDLRS Factor 4 Scores



The distribution of scores for SDLRS factor 5, love of learning, had a range of possible scores from 6 to 30. There were 386 valid responses to this item (Appendix W). As shown in Table 12, the actual range of scores on this factor was 13 to 30. The mean score for the sample on factor one was 22.13, and the standard deviation was 2.93. The frequency distribution for factor 5 scores is shown in Figure 8.

SDLRS factor 6, creativity, had a range of possible scores from 7 to 35. There were 382 valid responses to this item (Appendix X). As shown in Table 12, the actual

range of scores on this factor was 14 to 34. The mean score for the sample on factor six was 24.70, and the standard deviation was 3.53 (Figure 9).

Figure 8
Frequency Distribution for SDLRS Factor 5 Scores

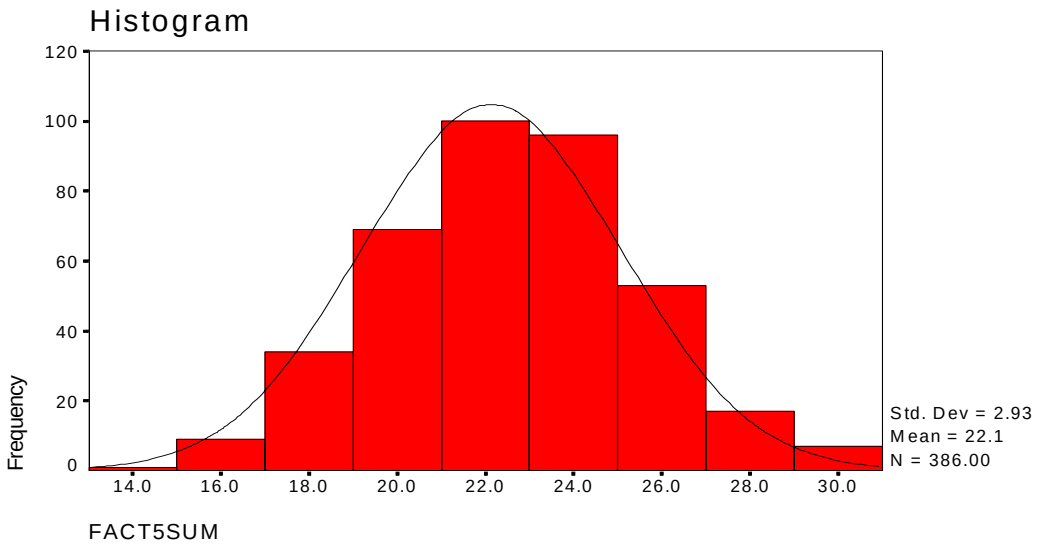
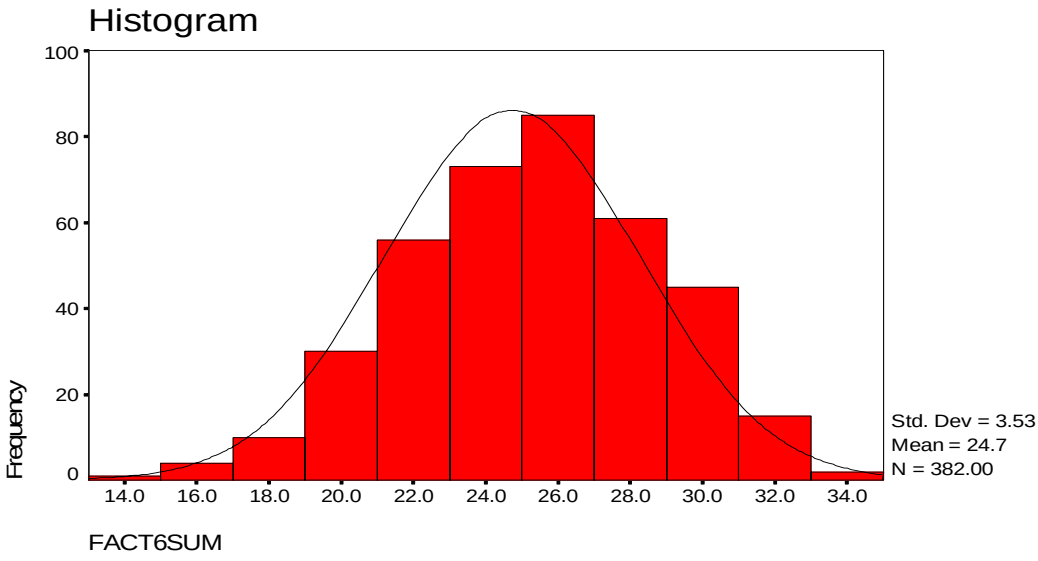
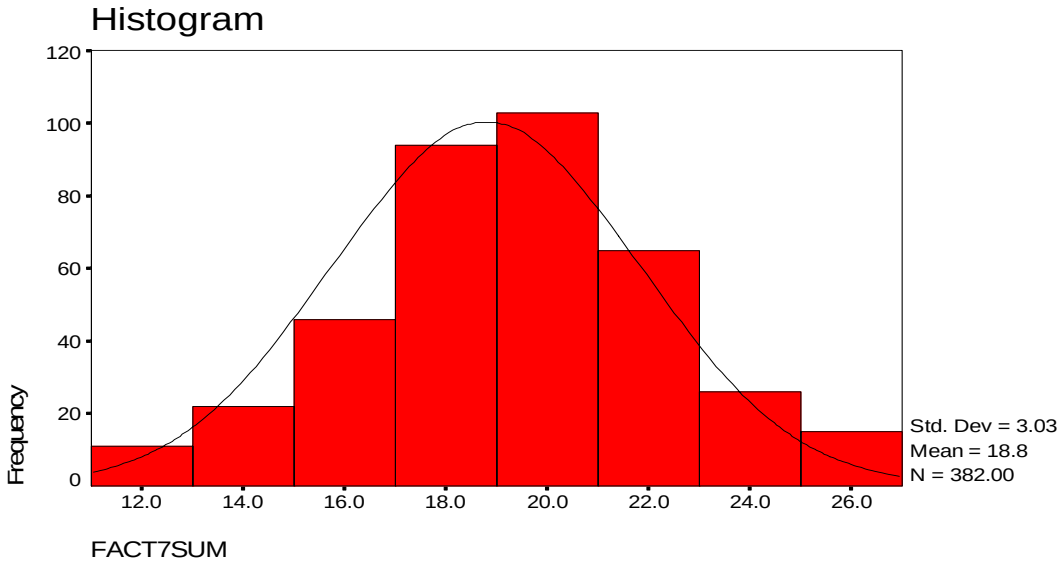


Figure 9
Frequency Distribution for SDLRS Factor 6 Scores



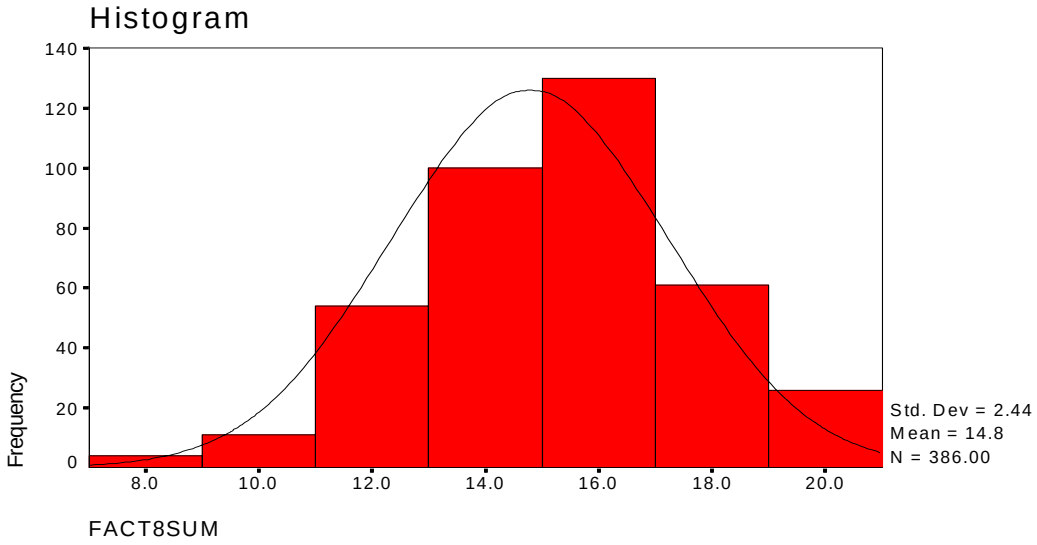
The distribution of scores for SDLRS factor 7, positive orientation to the future, had a range of possible scores from 5 to 25. There were 382 valid responses to this item (Appendix Y). As demonstrated in Table 12, the range of scores on this factor was 11 to 25. The mean score for the sample on factor one was 18.78, and the standard deviation was 3.03 (Figure 10).

Figure 10
Frequency Distribution for SDLRS Factor 7 Scores



The distribution of scores for SDLRS factor 8, ability to use basic study skills and problem-solving skills, had a range of possible scores from 4 to 20. There were 386 valid responses to this item (Appendix Z). As shown in Table 12, the actual range of scores on this factor was 8 to 20. The mean score for the sample on factor one was 14.79, and the standard deviation was 2.44 (Figure 11).

Figure 11
Frequency Distribution for SDLRS Factor 8 Scores



The SDLRS total scores were one half of a standard deviation above the average score for all adults. The SDLRS factor scores were mostly normally distributed across the sample. The mean scores and standard deviations were consistent with the number of items in each subset. Average item scores within factors ranged from a high of 3.94 (openness to learning opportunities) to a low of 3.53 (creativity).

Descriptive Analysis of the Epistemological Questionnaire

The Schommer Epistemological Questionnaire (SEQ) was developed in 1989 as part of Schommer's doctoral dissertation. The SEQ was a 63-item instrument designed to measure epistemological beliefs. The SEQ was composed of statements that participants rate on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was developed using a framework based on twelve characteristics of a naïve view of knowledge and learning derived from the literature, for example beliefs and behaviors such as "seek single answers" or "avoid integration." Items were developed to sample an

individual's extent of agreement with each characteristic. Half of the items were worded in such a way that a person who had a naïve view of knowledge and learning would agree and half were worded that such a person would disagree. The items to which an individual with a naïve view of knowledge would disagree were then recoded. Consequently, the higher the score, the more naïve the individual's view of knowledge and learning.

Scores on the twelve characteristics (subsets) of a naïve view of knowledge and learning were then calculated and subjected to a factor analysis. The factor analysis yielded four factors, which Schommer (1989) named fixed ability, simple knowledge, quick learning, and certain knowledge. Subsequent research using the SEQ has yielded different numbers of factors as well as different factor loadings (Clarebout et al., 2001; Hofer & Pintrich, 1997; Jehng, 1991; Schommer et al., 1992; Schommer, 1993a; Schommer, 1993b; Schommer & Dunnell, 1997; Schommer & Walker, 1997) suggesting that the factor structure of the instrument may depend on the population being studied.

Table 13 presents the factor scores (expressed as Z scores) obtained in the present study with those reported by Schommer (1993) in the *Research in Higher Education* article. In Schommer's study, junior college students were more likely than university students to believe in simple knowledge, certain knowledge, and quick learning. University students were more likely than community college students to believe in fixed ability. As compared with the university students in Schommer's sample, the students in this sample were more likely to believe in simple knowledge and certain knowledge and less likely to believe in fixed ability or quick learning. The community college students in Schommer's sample were more likely to believe in quick learning than the students in

this sample, and the university students in Schommer's study were more likely to believe in fixed ability than this sample. Of the three groups, the students from this sample were most likely to believe in simple knowledge and certain knowledge, the university students in Schommer's study were most likely to believe in fixed ability, and the community college students were most likely to believe in quick learning.

Table 13
Factor Scores (expressed as Z scores) for the Epistemological Questionnaire

	Boden (2005)		Schommer (1993)			
	Mean[a]	Standard Deviation	Community College Mean[b]	Community College Standard Deviation	University Mean[c]	University Standard Deviation
Simple Knowledge	.261	1.725	.180	.689	-.141	.865
Fixed Ability	-.042	1.816	-.240	.828	.187	.729
Quick Learning	-.036	1.802	1.07	.790	-.083	.733
Certain Knowledge	.386	1.574	.093	.590	-.073	.673

[a]n=336. [b]n=116. [c]n=76.

Scores on the twelve characteristics (subsets) of a naïve view of knowledge and learning obtained in this study were subjected to a factor analysis in order to explore whether the same four factors emerged. Instead, the solution produced five factors. This finding is consistent with other analyses of the SEQ (Clarebout et al., 2001) and with other findings that there are five dimensions to epistemological beliefs (Jehng, 1991). Factor 1 included four characteristics (subsets) with factor loadings ranging from .353 to .706. The items most closely related to Schommer's factor innate ability. Factor 2 was

comprised of four characteristics (subsets) with factor loadings ranging from .318 to .588, and its items most closely related to Schommer's factor quick learning. Factor 3 included two characteristics (subsets) with factor loadings ranging from .442 to .716. The items most closely related to a factor identified in one of Schommer's studies (Schommer et al., 1992), knowledge is discrete and unambiguous. Factor 4 was made up of three characteristics (subsets) with factor loadings ranging from .349 to .514 and items most closely related to Schommer's factor simple knowledge. Finally, factor 5 was comprised of three characteristics (subsets) with factor loadings ranging from .302 to .354 and items most closely related to Schommer's factor certain knowledge. Several characteristics (subsets) loaded onto more than one factor, making it difficult to interpret the factors derived from this population.

An exploratory factor analysis based on individual items rather than characteristic subset scores confirmed the five factor solution for this sample and yielded collections of items that were more interpretable. Factors with eigenvalues over 1 were extracted with Principal Axis Factoring and then rotated with Promax rotation with Kaiser Normalization. The rotation converged in 8 iterations. The five factors that emerged include: factor one, the truth is clear and unambiguous (14 items with factor loadings ranging from .310 to .498), factor two, thinking for yourself is a waste of time (13 items with factor loadings ranging from .300 to .484), factor three, learning does not require effort (eight items with factor loadings ranging from .314 to .558), factor four, knowledge should come quick (seven items with factor loadings ranging from .345 to .456), and factor five, intelligence is static (five items with factor loadings ranging from .305 to .505). The Cronbach's alpha for the SEQ for this sample was .68. The Cronbach's alpha

for each factor follows: factor 1 was .74, factor 2 was .70, factor 3 was .60, factor 4 was .72, and factor 5 was .47. The inter-item correlations were between .32 and .54 for factor 1, between .35 and .55 for factor 2, between .36 and .65 for factor 3, between .38 and .54 for factor 4, and between .38 and .63 for factor 5. This procedure for analyzing the SEQ factors has been suggested in the literature (Clarebout et al., 2001; Cole et al., 2000; Hofer & Pintrich 1997), and these results are comparable to those of other analyses based on the 58 items.

The 394 surveys administered yielded between 369-383 valid SEQ factor scores. Between 11 and 25 questionnaires did not produce factor scores due to missing items. Table 14 summarizes the range of possible factor scores, the range of scores in the sample, the mean, and the standard deviation for each of the five factors identified in the factor analysis conducted with this sample. For comparison purposes, the average item score for each factor is also listed.

Table 14
Epistemological Questionnaire Factor Scores

Factor	Possible Range	Range of Scores in Sample	Mean	Standard Deviation	Average Item Score
Factor 1: The Truth is Clear and Unambiguous	14-70	19-63	39.26	5.83	2.80
Factor 2: Thinking for Yourself is a Waste of Time	13-65	18-42	30.44	4.17	2.34
Factor 3: Learning does not Require Effort	8-40	11-32	19.62	3.19	2.50
Factor 4: Knowledge Should Come Quick	7-35	8-26	18.11	2.95	2.30
Factor 5: Intelligence is Static	5-25	7-18	11.52	1.92	2.30

The specific items that make up each of the five factors are listed in Appendix AA. The distribution of mean scores across the sample for each factor is shown in Figures 12-16.

As shown in Figure 12, the distribution of SEQ factor 1, the truth is clear and unambiguous, had a range of possible scores from 14 to 70. There were 379 valid responses (Appendix AB). As shown in Table 14, the range of actual scores on this factor was 19 to 63. The mean score for the sample on factor one was 39.26, and the standard deviation was 5.83.

The distribution of SEQ factor 2, thinking for yourself is a waste of time, had a range of possible scores from 13 to 65. There were 369 valid responses calculated in this factor (Appendix AC). As shown in Table 14, the range of actual scores on this factor was 18 to 42. The mean score for the sample on factor one was 30.44, and the standard deviation was 4.17. The distribution of mean scores follows in Figure 13.

Figure 12
Factor 1: Truth is Clear and Unambiguous

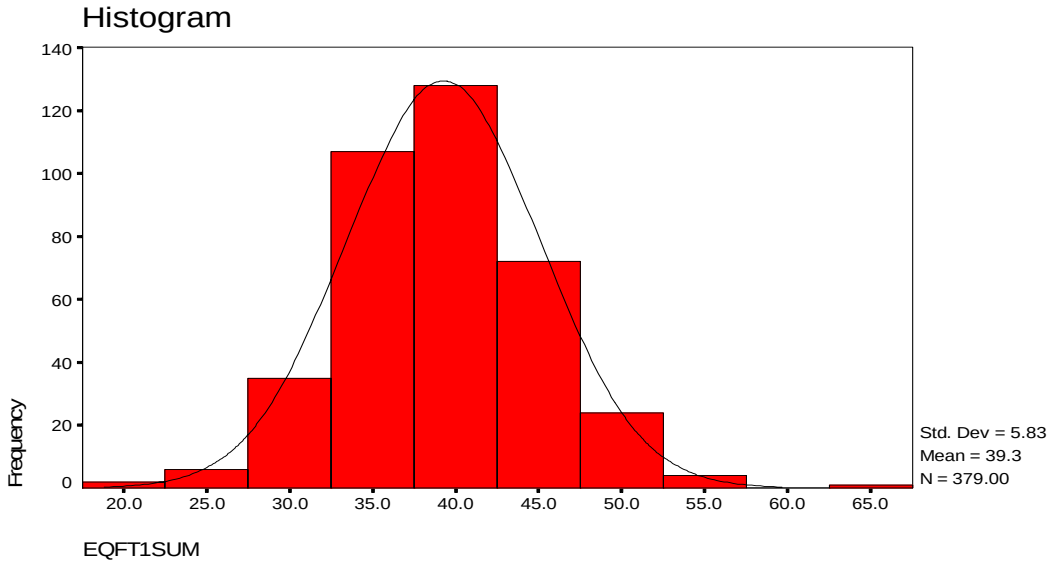
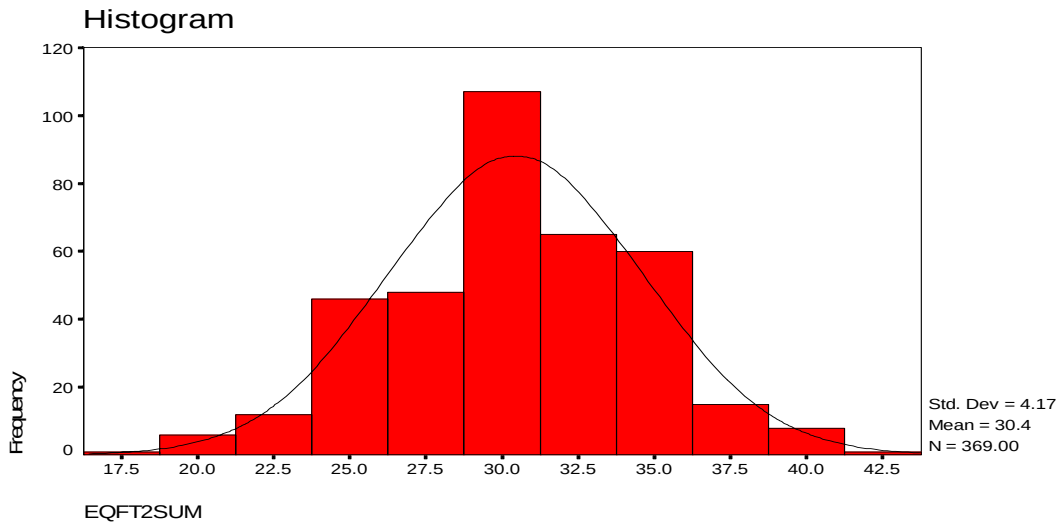


Figure 13
Factor 2: Thinking for Yourself is Waste of Time



The distribution of SEQ factor 3, learning does not require effort, had a range of possible scores from 8 to 40. There were 385 valid responses calculated in this factor (Appendix AD). As shown in Table 14, the range of actual scores on this factor was 11 to 32. The mean score for the sample on factor three was 19.62, and the standard deviation was 3.19. The distribution of mean scores across the sample is shown in Figure 14.

The distribution of SEQ factor 4, knowledge should come quick, had a range of possible scores from 7 to 35. There were 383 valid responses calculated in this factor (Appendix AE). As shown in Table 14, the range of actual scores on this factor was 8 to 26. The mean score for the sample on factor one was 18.11, and the standard deviation was 2.95. The distribution of mean scores across the sample is shown in Figure 15.

Figure 14

Factor 3: Learning Does Not Require Effort

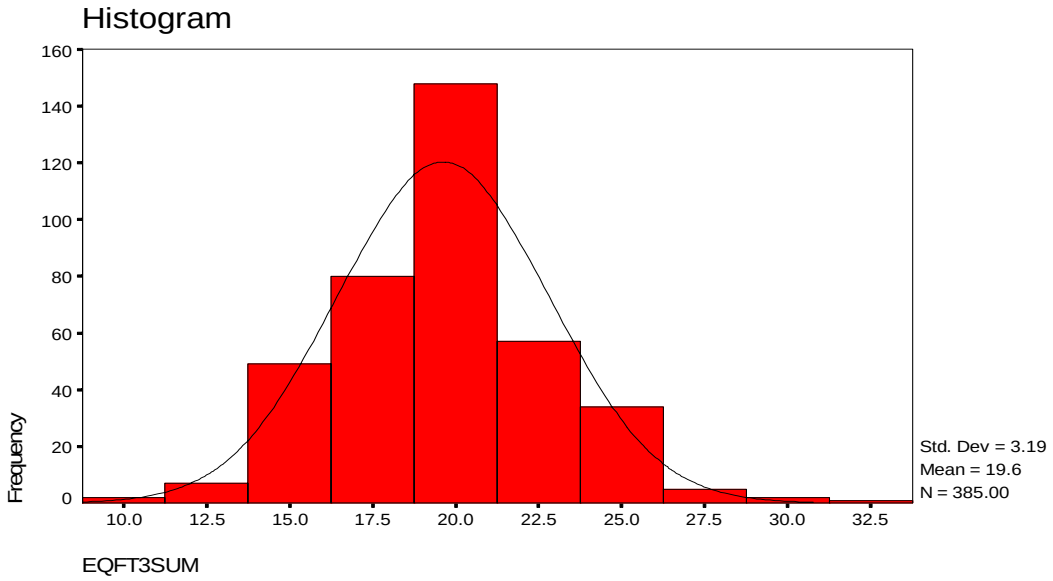
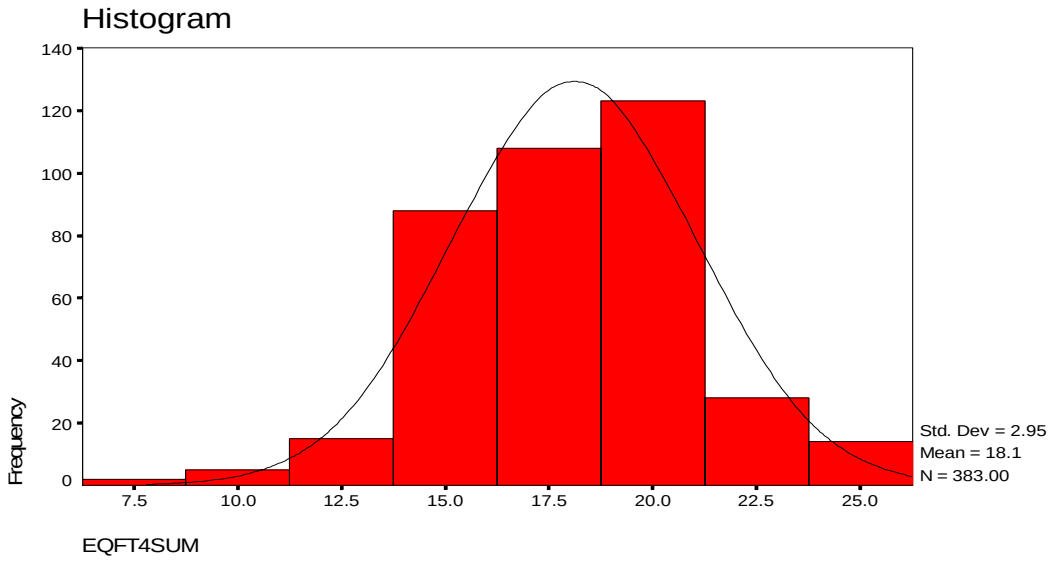


Figure 15

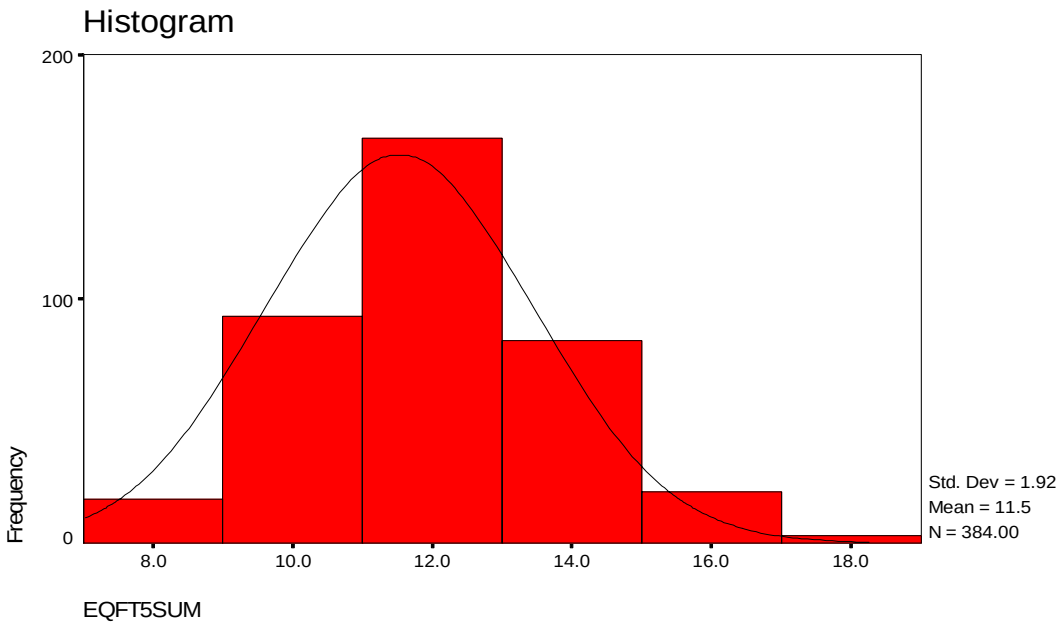
Factor 4: Knowledge Should Come Quick



The distribution of SEQ factor 5, intelligence is static, had a range of possible scores from 5 to 25. There were 384 valid responses calculated in this factor (Appendix

AF). As shown in Table 14, the range of actual scores on this factor was 7 to 18. The mean score for the sample on factor one was 11.52, and the standard deviation was 1.92. The distribution of mean scores across the sample is shown in Figure 16.

Figure 16
Factor 5: Intelligence is Static



The SEQ factor scores were mostly normally distributed across the sample. The mean scores and standard deviations were consistent with the number of items in each factor.

Research Questions and SDLRS Correlations

Several research questions for this study focused on the correlations between demographic factors, educational factors, learner perception of self-directedness, and learner epistemological beliefs.

As shown in Table 15, there were no significant findings for research question number two, is there a statistically significant correlation between learner perception of

self-directedness as measured by the Self-Directed Learning Readiness Scale (SDLRS) and the demographic variables of age, gender, race, marital status, parents' education level, and rural or urban residence? In general, the correlations were small. The only correlation that was close to significant was marital status p<.064; however, as Table 15 demonstrates, this factor accounts for less than one percent of the variance in SDLRS total scores. The correlations of SDLRS total scores and demographic factors ranged from p<.064 for marital status to p<.952 for rural or urban population (Table 15).

Table 15
Correlation Coefficients of Demographic Variables and SDLRS Total Scores

	Correlation Coefficient	Percent of Variance Explained
Age[a]	.0472	00.22
Gender[b]	.0375	00.14
Race[c]	.0162	00.03
Marital Status[d]	.1000	01.00
Mother's Education[e]	.0290	00.08
Father's Education[f]	-.0634	00.40
Rural or Urban Residence[g]	.0032	00.00

[a]n=343. [b]n=342. [c]n=343. [d]n=343. [e]n=338. [f]n=342. [g]n=343.
*p<.05. ** p<.01. ***p<.001

As shown in Table 16, there were several significant findings in response to research question number three, is there a statistically significant correlation between learner perception of self-directedness as measured by the SDLRS and educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type

of program? The variables of class standing, grade point average, exposure to the humanities, and exposure to self-directed learning through the utilization of learning contracts were significant at the .05 level with values p< .01. Collectively, these variables accounted for about 10% of the variance in SDLRS total scores.

Table 16
Correlation Coefficients of Educational Variables and SDLRS Total Scores

	Correlation Coefficient	Percent of Variance Explained
Class Standing[a]	.1680**	02.82
Grade Point Average[b]	-.1547**	02.39
Major Field of Study[c]	.0173	00.03
Exposure to the Humanities[d]	.1823***	03.32
Exposure to the Social Sciences[e]	.1708**	03.39
Number of Times Utilizing Learning Contracts[f]	.1269**	01.61
Credits Earned Through Independent or Directed Studies[g]	.0496	00.25
Credits Earned Through Experiential Learning[h]	.0799	00.64
Type of Program[i]	-.0562	00.32

[a]n=342. [b]n=341. [c]n=342. [d]n=343. [e]n=340. [f]n=343. [g]n=343. [h]n=343. [i]n=343.
*p<.05. ** p<.01. ***p<.001

The positive correlation of SDLRS total score with class standing, exposure to the humanities, exposure to the social sciences, and the number of times utilizing learning contracts indicated that for this sample, the more advanced in class standing, the more coursework in the humanities and social sciences, and the more the students had utilized

learning contracts, the higher the learner's perception of their readiness for self-directed learning. The negative correlation of grade point average with SDLRS total score suggests a negative relationship between grade point average and learner perception of self-directed readiness. The counterintuitive nature of this finding for this sample may be partially attributed to the high number of participants (73.7%) who reported a cumulative grade point average of 3.2 or higher. The frequency distributions of the educational variables are in Appendices AG, AH, AI, and AJ.

Many of these findings on the relationships between self-directedness and demographic and educational variables confirm the findings of other studies on self-directed learning. For example, a positive relationship between class standing and learner perception of self-directedness was reported in the studies of Sabbaghian (1979) and Cunningham (1988). In another example, the correlation of exposure to learning contracts and self-directedness was also reported in many works (Caffarella, 1983; Candy, 1991; Kasworm, 1983). The findings on the relationship between SDLRS total scores and grade point average contradict earlier findings (Box 1983; Crook, 1985; Murray, 1987; Savoie, 1979). This unusual finding may be the result of the large percentage of students reporting a cumulative grade point average of 3.2 or higher. It is particularly interesting to compare these findings on exposure to the liberal arts and the social sciences with the work of Kegan (1994), who claimed that the goal of meeting the practical needs of adult students can be accomplished through a liberal arts education which fosters the order of consciousness that enables self-direction.

As Table 17 indicates, there were several significant findings in regard to research question number 4.

Table 17
Correlation Coefficients of Demographic Variables and SDLRS Factors

	SDL 1	SDL 2	SDL 3	SDL 4	SDL 5	SDL 6	SDL 7	SDL 8
Age[a]	.1671**	-.0399	.0337	-.1466**	.0749	-.0087	.0172	.0104
Gender[b]	.1574**	-.1421**	.1929***	-.1660**	-.0581	.0155	.0896	.0613
Race[c]	.1138*	-.0477	-.0263	.0695	-.0778	-.0156	-.0201	.0065
Marital Status[d]	.0454	.0044	.0690	.0036	.0885	.0450	-.0559	.1616**
Mother's Education[e]	-.0009	.07949	-.0307	.0293	.0962	-.1141*	.0146	-.0064
Father's Education[f]	-.0687	-.0103	-.0302	.0327	.0402	-.1526**	.0262	-.0693
Rural or Urban Residence[g]	.0640	.0573	.0078	.0086	-.0187	.0161	-.0382	.0193

[a]n=343. [b]n=342. [c]n=343. [d]n=343. [e]n=338. [f]n=342. [g]n=343.
*p<.05. ** p<.01. ***p<.001

Research question number 4 posed the question, is there a statistically significant correlation between the factors outlined in the SDLRS—openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, positive orientation to the future, and ability to use basic study skills and problem-solving skills—and the demographic variables of age, gender, race, marital status, parents' education level, and rural or urban residence? A discussion of the significant findings in regard to this question follows.

Factor 7, positive orientation to the future, and factor 5, love of learning, were not significantly correlated with any demographic variables. Factor 1, openness to learning opportunities, was positively correlated with age, gender, and race. These variables accounted for about 6.6% of the variance in factor 1 scores. The relationship between these demographic variables and factor 1 are significant at the .05 level with values $p < .035$. The positive correlation with age shows that the older students in the sample reported a higher openness to learning opportunities than younger students. Similarly, Caucasian students and women reported a higher openness to learning opportunities than other groups.

Factor 2, self-concept as an effective, independent learner, and factor 3, initiative and independence in learning, were correlated with gender at the $p<.009$ and $p<.0001$ levels respectively. In factor 2, gender accounted for two percent of the variance in factor scores and the correlation was negative while in factor 3 gender accounted for 3.7% of the variance in factor scores and there was a positive correlation. These correlations suggest that men reported seeing themselves as effective, independent learners while women reported a higher initiative in learning. Factor 4, informed acceptance of responsibility for one's own learning, was negatively correlated with age and gender with values $p<.007$ and $p<.002$. These correlations accounted for about five percent of the variance in factor 4 scores. The negative correlation suggests that the older students in the sample were less likely to take responsibility for their own learning and that women were more likely to take responsibility for their own learning.

Factor 6, creativity, was negatively correlated with the mother's and father's educational levels with values of $p<.036$ and $p<.005$, respectively. These variables

accounted for 3.6% of the variance in factor 6 scores. These correlations suggest that the lower the education level of the mother and father, the less creative the participants view themselves. Factor 8, ability to use basic study skills and problem solving skills, was correlated with marital status at the $p<.003$ level. This correlation accounted for 2.6% of the variance. This correlation suggests that married students are more likely to apply basic study and problem solving skills than those in other groups. For frequencies across the significant demographic variables see Appendices M, N, O, AK, and AL.

There were several significant findings in regard to research question number 5, is there a statistically significant correlation between the factors outlined in the SDLRS—openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, positive orientation to the future, and ability to use basic study skills and problem-solving skills—and the educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program? These relationships are outlined in Table 18.

Factor 3, initiative and independence in learning, and factor 7, self-understanding, were not significantly correlated with any of the educational variables. Factor 1, openness to learning, was positively correlated with exposure to the humanities and exposure to self-directed learning via utilizing learning contracts. These variables accounted for 4.7% of the variance in factor 1 scores. The relationship between these educational variables and factor 1 are significant at the $p<.005$ and $p<.004$ levels respectively. These positive relationships suggests that the more exposure to humanities courses students had and the

more they utilized learning contracts, the more the participants perceived themselves as open to new learning opportunities.

Table 18
Correlation Coefficients of Educational Variables and SDLRS Factors

	SDL 1	SDL 2	SDL 3	SDL 4	SDL 5	SDL 6	SDL 7	SDL 8
Class[a]	.0684	.2084***	.0501	.1166*	.1121*	-.1109*	.0388	-.0538
GPA[b]	-.0859	-.0552	-.0217	-.0520	-.2049***	-.0089	.0128	-.0699
Major[c]	-.0541	-.0263	-.0032	.0416	.0683	.0640	-.0362	.0659
Exp. Human.	.1504**	.1503**	.0721	.0279	.1535**	-.0300	-.0169	-.0334
Exp. Soc. Sci.[e]	.0620	.1507**	.0820	.1067*	.1674**	-.0901	.0408	-.0221
Learning Contracts[f]	.1548**	.0887	.0115	.0287	.0006	.0056	.0535	-.0158
Indep. or Dir. Stud.[g]	-.0031	.1205*	.0349	-.0081	.0848	-.0250	-.0743	-.0276
Exp. Learning[h]	.0820	.1034+	.0174	.0291	.0266	.0753	-.0433	-.0851
Type of Program[i]	.0325	-.1246*	-.0540	-.0529	-.0986	.1131*	-.0501	.1059*

+.056
[a]n=342. [b]n=341. [c]n=342. [d]n=343. [e]n=340. [f]n=343. [g]n=343. [h]n=343. [i]n=343.
*p<.05. ** p<.01. ***p<.001

Factor 2, self-concept as an effective, independent learner, was positively correlated with class standing (p<.0001), exposure to the humanities (p<.005), exposure to the social sciences (p<.005), credits earned through independent or directed studies (p<.026), and type of program (p<.021). The educational variable credits earned through

experiential learning was very nearly positively correlated with factor 2, self-concept as an effective, independent learner ($p<.056$). Since the p value is so close to .05, this variable will be discussed as important for the purposes of this exploratory analysis. These correlations accounted for almost 13% of the variance in factor 2 scores. Self-concept as an effective, independent learner is higher for those students who were more advanced in class standing, who had taken more humanities and social sciences courses, and who had engaged in self-directed learning activities through completing directed studies or through completing experiential learning credits and were are in a non-cohort program.

Factor 4, informed responsibility for one's own learning, was positively correlated with class standing and with exposure to the social sciences at the $p<.031$ and $p<.049$ levels, respectively. These correlations accounted for 2.5% of the variance in factor 4 scores and suggest that those students in the sample with more credits earned and with more credits completed in the social sciences were more likely to take responsibility for their own learning. Factor 5, love of learning, was significantly positively correlated with class standing ($p<.038$), exposure to the humanities ($p<.004$), and exposure to social sciences ($p<.002$). These correlations account for 6.4% of the variance in factor 5 scores and suggest that participants who were upperclassmen and with more hours in the humanities and the social sciences were more likely to view themselves as lovers of learning. Factor 5 was negatively correlated with grade point average at the $p<.0001$ level, and this correlation accounted for 4.19% of the variance. This negative correlation could be the result of the large percentage of students (73.4%) reporting a cumulative grade point average of 3.2 or above.

Factor 6, creativity, was negatively correlated with class standing ($p<.040$) and positively correlated with type of program ($p<.036$). The negative correlation between creativity and class standing accounted for only 1.2% of the variance in Factor 6 scores. This finding suggests that the upperclassmen in the sample described themselves as less creative than the lowerclassmen. The positive correlation with type of program accounted for 1.27% of the variance in factor 6 scores and suggests that those students enrolled in cohort programs viewed themselves as being more creative than those students not enrolled in cohort programs. Factor 8, ability to use basic study skills and problem solving skills, was positively correlated with type of program at the $p<.050$ level. This finding accounts for only 1.12% of the variance in factor 8 scores and suggests that those enrolled in cohort programs viewed themselves as able to utilize a variety of study and problem solving skills.

In this sample, the demographic and educational variables correlated with many of the factors of the SDLRS. For factor 1, openness to learning opportunities, older students reported a higher openness to learning opportunities than younger students. Similarly, Caucasian students and women reported a higher openness to learning opportunities than other groups. Students with more exposure to the humanities and to learning contracts reported perceiving themselves as open to learning opportunities. Gender was significantly correlated with factor 2, self-concept as an effective, independent learner. Men were likely to see themselves as independent, effective learners. Self-concept as an effective, independent learner was higher for students who were more advanced in class standing, who had taken more humanities and social sciences courses, and who had more exposure to self-directed and experiential learning,

and who were not enrolled in cohort programs. Factor 3, initiative and independence in learning, was also correlated with gender. Women reported taking more initiative in learning than men.

Factor 4, informed acceptance of responsibility for one's own learning, was correlated with age and gender. Women reported perceiving themselves as responsible for their own learning, and the older students in the sample reported seeing themselves as less responsible for their own learning than younger students. Students who had advanced in class standing reported seeing themselves as responsible for their own learning. Likewise, students how had earned more hours in the social sciences reported seeing themselves as responsible for their own learning. Factor 5, love of learning, was not significantly correlated with any demographic variables, but this factor was positively correlated with class standing, exposure to the humanities, and exposure to the social sciences. Students with more credits in these areas reported a higher love of learning than those who had earned less credits. This factor was negatively correlated with cumulative grade point average.

Factor 6, creativity, was negatively correlated with parents' education level. This suggests that the lower the education level of the parents, the less the respondents reported seeing themselves as creative. Creativity was also negatively correlated with class standing as lowerclassmen reported being more creative than upperclassmen, and cohort group students reported seeing themselves as more creative than non-cohort students. There were no significant correlations with factor 7, positive orientation to the future. Factor 8, ability to use basic study skills and problem-solving skills, was correlated with marital status and with program type. These findings suggest that married

students and those enrolled in cohort programs were more likely than student in other groups to view themselves as applying study skills and problems solving skills.

Research Questions and Epistemological Questionnaire Correlations

There were several significant findings in regard to research question number 6, is there a statistically significant relationship between the factors outlined in the Schommer Epistemological Questionnaire (SEQ)—the truth is clear and unambiguous, thinking for yourself is a waste of time, learning does not require effort, knowledge should come quick, and intelligence is static—and the demographic variables of age, gender, race, marital status, parents' education level, and rural or urban residence? (Table 19).

Table 19
Correlation Coefficients of Epistemological Questionnaire Factors and Demographic Variables

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Age[a]	-.0503	-.0704	-.2316***	-.1717**	-.0083
Gender[b]	-.1358*	.0357	-.1844***	.0771	-.0904
Race[c]	.1194*	-.0058	.0058	.0447	.1327*
Marital Status[d]	-.0161	-.1419**	-.0197*	-.1306*	-.1123*
Mother's Education[e]	-.0693	.0067	.0574	-.0469	-.0382
Father's Education[f]	.0731	.0397	.1304*	-.0620	.0365
Rural or Urban Residence[g]	-.0140	-.0540	.0151	-.0213	.0162

[a]n=335. [b]n=334. [c]n=335. [d]n=335. [e]n=332. [f]n=334. [g]n=335.
*p<.05. ** p<.01. ***p<.001

Factor 1, the truth is clear and unambiguous, was positively correlated with race (p<.029) and negatively correlated with gender (p<.013). The correlations accounted for 1.8% and 2.9% of the variance in Factor 1 scores, respectively. This finding suggests that

men were more likely than women and other racial groups were more likely than Caucasians to report that the truth is clear and unambiguous. Factor 2, thinking for yourself is a waste of time, was negatively correlated with marital status at the $p<.009$ level. This correlation accounted for two percent of the variance in Factor 2 scores.

Factor 3, learning does not require effort, was negatively correlated with age, gender, and marital status. These correlations accounted for 8.8% of the variance in Factor 3 scores. The correlation with age was strong with a $p<.0001$ correlation. This finding suggests that older students reported that learning requires effort. The correlation with gender was significant at the $p<.001$ level while the correlation with marital status was significant at the $p<.045$ level. These correlations suggest that men and married students were more likely than other groups to report that learning requires effort. Factor 3 was positively correlated with father's level of education with a significance level of $p<.017$. This finding accounted for 1.7% of the variance in Factor 3 scores and suggests that respondents whose father had a lower level of education were more likely to agree with the naive statements that learning does not require effort. Factor 4, knowledge should come quick, was negatively correlated with age at the $p<.002$ level and with marital status at the $p<.017$ level. These findings accounted for about 4.66% of the variance in Factor 4 scores. This finding suggests that older students and married students were less likely to report that learning is quick.

Factor 5, intelligence is static, was positively correlated with race at the $p<.015$ level and negatively correlated with marital status at the $p<.040$ level. These correlations accounted for about three percent of the variance in Factor 5 scores. These findings suggest that groups other than Caucasians were more likely to report the belief in static

intelligence while married students were less likely to report belief in static intelligence. Frequency distributions of the demographic variables are available in Appendices M, N, O, AK, and AL.

There were several significant findings in regard to research question number seven, is there is a statistically significant relationship between the factors outlined in the SEQ—the truth is clear and unambiguous, thinking for yourself is a waste of time, learning does not require effort, knowledge should come quick, and intelligence is static—and the educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program? The correlation coefficients for the SEQ follow in Table 20.

Factor 1, the truth is clear and unambiguous, was positively correlated with grade point average at the $p<.004$ level. This correlation accounted for approximately 2.5% of the variance in Factor 1 scores. This finding is counterintuitive in that it suggests that those respondents with higher grade point averages reported that they believed the naïve statement, truth is clear and unambiguous. At least part of the variance for this finding may be explained by the large percentage of students (73.4%) reporting a cumulative grade point average of 3.2 or higher. Factor 1 was negatively correlated with exposure to the humanities and exposure to social sciences at the $p<.020$ and the $p<.012$ levels, respectively. These correlations accounted for 3.5% of the variance in factor 1 scores. This finding suggests that respondents who had earned more credits in the liberal arts and social sciences disagreed with the notion that the truth is clear and unambiguous.

Table 20
Correlation Coefficients of Epistemological Questionnaire Factors and Educational Variables

	SEQ 1	SEQ 2	SEQ 3	SEQ 4	SEQ 5
Class[a]	-.0299	-.1322*	.1417*	-.0521	.0996
GPA[b]	.1575**	.2145***	-.0297	.1568**	.1015
Major[c]	-.0507	.0234	-.0747	-.0851	-.0070
Exp. Human.[d]	-.1274*	-.2147***	.0801	-.1774**	.0335
Exp. Soc. Sci.[e]	-.1376*	-.1450**	.0367	-.0653	.0218
Learning Contracts[f]	-.0019	-.0486	-.0552	-.0683	.0658
Indep. or Dir. Stud.[g]	.0269	-.0052	.0413	.0102	.0072
Exp. Learning[h]	.0540	-.0469	.0291	.0375	.0218
Type of Program[i]	-.0031	.0594	-.2007***	-.0483	-.1570**

[a]n=333. [b]n=334. [c]n=334. [d]n=335. [e]n=332. [f]n=335. [g]n=335. [h]n=335. [i]n=335.
*p<.05. ** p<.01. ***p<.001

Factor 2, thinking for yourself is a waste of time, was negatively correlated with class standing (p<.016), exposure to the humanities (p<.0001), and exposure to the social sciences (p<.008). These correlations accounted for 8.5% of the variance in factor 2 scores. This finding suggests that respondents who had advanced in class standing were more likely to disagree with the idea that thinking for oneself is a waste of time. Likewise, respondents with a larger number of earned credit hours in the humanities and social sciences were also more likely to disagree with the belief that thinking for oneself is a waste of time. Factor 2 was positively correlated with grade point average at the p<.0001 level. This correlation accounted for 4.6% of the variance in factor 2 scores. This

finding suggests that those with a higher grade point average are more likely to believe that thinking for oneself is a waste of time. This finding can be at least partially explained by the large percentage of students (73.4%) reporting a cumulative grade point average of 3.2 or higher.

Factor 3, learning does not require effort, was positively correlated with class standing at the $p<.010$ level and negatively correlated with type of program at the $p<.0001$ level. These correlations accounted for six percent of the variance in factor 3 scores. These findings suggest that upperclassmen in a cohort program believed that learning does not require effort while lowerclassmen in a non-cohort program believed that learning does require effort. Factor 4, knowledge should come quick, was negatively correlated with exposure to the humanities at the $p<.001$ level and positively correlated with grade point average at the $p<.004$ level. These correlations accounted for 5.6% of the variance in factor 4 scores. These findings suggest that students with more exposure to the humanities did not agree with the statement that learning is quick. The positive correlation with grade point average suggests that those with a higher grade point average were more likely to report that knowledge should come quick. The positive correlation with grade point average again can be at least partially explained by the large percentage of students (73.4%) reporting a cumulative grade point average of 3.2 or higher. Factor 5, intelligence is static, was positively correlated with type of program at the $p<.004$ level. This correlation accounted for 2.5% of the variance in factor 5 scores, and this correlation suggests that those enrolled in a cohort program were more likely to believe that intelligence is static and than those who are not enrolled in a cohort program. Frequency tables of the significant educational variables are in Appendices Q, AH, and AJ.

Factor 1, the truth is clear and unambiguous, was negatively correlated with gender and positively correlated with race. This finding suggests that women in the sample did not report that they agree with the statement that the truth is clear and unambiguous while Caucasians were more likely to disagree with this statement than any other group.

This factor was negatively correlated with exposure to the humanities and exposure to social sciences, suggesting that respondents who had earned more credits in the liberal arts and social sciences were more likely to disagree with the notion that the truth is clear and unambiguous. Finally, this factor was positively correlated with grade point average. This seemingly contradictory finding can be at least partially explained by the large percentage of students reporting a cumulative grade point average of 3.2 or higher.

Factor 2, thinking for yourself is a waste of time, was negatively correlated with marital status, class standing, exposure to the humanities, and exposure to the social sciences, suggesting that students who were married, students who were advanced in class standing, and students with more exposure to the humanities and the social sciences were more likely to consider thinking an important and productive activity. Like factor 1, this factor was also was positively correlated with grade point average.

Factor 3, learning does not require effort, was negatively correlated with age, gender, and marital status, and type of program suggesting that older students, women, married students, and students who were not enrolled in a cohort program were more likely to report that learning does require effort. Father's level of education and class standing were positively correlated with this factor suggesting that respondents who were

advanced in class standing and whose father had a lower level of education were more likely to agree with the naive statement that learning does not require effort.

Factor 4, knowledge should come quick, was negatively correlated with age and with marital status. This finding suggests that older students and married students in the sample were less likely to report that learning is quick. This factor was negatively correlated with exposure to the humanities suggesting that students with more exposure to the humanities do not agree with the statement that learning is quick. This factor, like factors one and two, was positively correlated with grade point average, suggesting that students with higher grade point averages were more likely to agree with the naïve statement, knowledge should come quick. Factor 5, intelligence is static, was positively correlated with race and negatively correlated with marital status and type of program. These findings suggest that married students were less likely to believe that intelligence is static, and racial minorities and students enrolled in cohort programs were more likely to believe in the notion of static intelligence.

Research Questions and Self-Directed Learning Readiness Scale and Epistemological Questionnaire Correlations

There were several significant findings in regard to research question number 8, is there is a statistically significant relationship between learner perception of self-directedness as measured by the SDLRS and learner epistemological beliefs as measured by the SEQ?

Table 21 presents the correlation coefficients, percent of variance explained, and significance for the SDLRS total scores and the five factor scores derived from the SEQ.

Table 21
Correlation Coefficients of SDLRS Total Scores and Epistemological Questionnaire Factor Scores

	Correlation Coefficient	Percent of Variance Explained
Factor 1: The Truth is Clear and Unambiguous	-.0054	00.00
Factor 2: Thinking for Yourself is a Waste of Time	-.3632***	13.19
Factor 3: Learning does not Require Effort	-.0572	00.33
Factor 4: Knowledge Should Come Quick	-.3237***	10.98
Factor 5: Intelligence is Static	-.1227*	01.51

n=301.
*p<.05. ** p<.01. ***p<.001

Three factors had corrections that were statistically significant. Factor 2, thinking for yourself is a waste of time, was negatively correlated with the SDLRS total scores at the p<.0001 level. Factor 2 accounted for 13.19% of the variance in the SDLRS total scores. Factor 4, knowledge should come quick, was negatively correlated with the SDLRS total scores at the p<.0001 level. This correlation accounted for 10.48% of the variance in SDLRS total scores. Factor 5, intelligence is static, was negatively correlated with SDLRS total scores at the p<.033 level. This correlation accounted for 1.5% of the variance in SDLRS total scores. These relationships suggest that the less students believe thinking is a waste of time, the less they believe that knowledge should come quick, and the less they believe that knowledge is static, the more they perceive themselves as being self-directed.

There were several significant findings in regard to research question number 9, is there a statistically significant relationship between the factors outlined in the SEQ—the truth is clear and unambiguous, thinking for yourself is a waste of time, learning does not require effort, knowledge should come quick, and intelligence is static—and the factors outlined in the SDLRS—openness to learning opportunities; self-concept as an effective learner; initiative and independence in learning; informed acceptance of responsibility for one's own learning; love of learning; creativity; positive orientation to the future and ability to use basic study skills and problem-solving skills? Table 22 presents the correlation coefficients for the instruments' factors.

SDLRS factor 1, openness to learning opportunities, was negatively correlated with SEQ factor 2, thinking for yourself is a waste of time, SEQ factor 3, learning does not require effort, and SEQ factor 4, knowledge should come quick, at the $p<.0001$, $p<.002$, and $p<.001$ levels, respectively. Collectively, SEQ factors 2, 3 and 4 accounted for 11.55% of the variance in SDLRS factor 1 scores. The first correlation suggests that for this sample, those who are open to learning opportunities also value thinking for themselves. The second correlation suggests that those who are open to learning opportunities recognize that learning requires effort. The last correlation suggests that those who are open to learning opportunities do not believe that learning is quick. The correlations for these factors point to a relationship between openness to learning and more sophisticated epistemic views of thinking as an important activity and of learning as something that is neither easy nor quick.

SDLRS factor 2, self-concept as an effective learner, was negatively correlated with SEQ factor 2, thinking for yourself is a waste of time ($p<.0001$). Thus, SEQ factor 2 accounted for 5% of the variance in SDLRS factor 2 scores and suggests that those who see themselves as effective learners value the activity of thinking for oneself. Similarly, SDLRS factor 2, self-concept as an effective learner with negatively correlated with SEQ factor 4, knowledge should come quick ($p<.032$). SEQ factor 4 accounted for 3.31% of the variance in SDLRS factor 2 scores and suggests that those who see themselves as effective learners do not believe that learning is quick.

Table 22
Correlation Coefficients of Epistemological Questionnaire Factors and SDLRS Factors

	SEQ 1	SEQ 2	SEQ 3	SEQ 4	SEQ 5
SDLRS Factor 1	-.0256	-.2121***	-.1768**	-.1981***	.0113
SDLRS Factor 2	-.0368	-.2238***	.1801**	-.1234*	.0222
SDLRS Factor 3	.0900	-.1466*	-.2805***	-.0947	-.2517***
SDLRS Factor 4	-.0075	-.2875***	.0484	.0519	.0181
SDLRS Factor 5	-.1322*	-.0029	.2408***	-.3002***	-.0004
SDLRS Factor 6	.2002***	-.1812**	-.1253*	-.0625	-.0769
SDLRS Factor 7	.0658	-.0342	-.0201	-.0926	-.0250
SDLRS Factor 8	-.2042***	.0470	.0158	-.2291***	-.1594**

n=301.
*p<.05. ** p<.01. ***p<.001

Self-concept as an effective learner was positively correlated with SEQ factor 3, learning does not require effort ($p<.002$). SEQ factor 3 accounted for 3.24% of the variance in SDLRS factor 2 scores. A practical interpretation of this correlation is problematical because the conclusion is counterintuitive; the more the learner views himself as an effective learner, the more the learner believes that learning does not require effort. An alternative explanation to this positive loading is that it is possible that students who see themselves as effective learners do not find the learning process difficult. If one follows this logic, then this correlation suggests that those who view themselves as effective learners believe that learning does not require effort because of their effectiveness as learners. Of course, it would take additional study to support the second interpretation of this finding. A third explanation of this correlation is that Schommer's (1990) hypothesis that epistemological beliefs are more or less independent. According to this hypothesis, it is possible to be sophisticated in one area while remaining naïve in another. It is possible, then, that this particular group of students was epistemologically sophisticated in their beliefs about the value of thinking and epistemologically naïve about the effort required in the learning process.

SDLRS factor 3, initiative and independence in learning, was negatively correlated with SEQ factor 2, thinking for yourself is a waste of time ($p<.011$), SEQ factor 3, learning does not require effort ($p<.0001$), and SEQ factor 5, intelligence is static ($p<.0001$). Collectively, these negative correlations accounted for 16.35% of the variance in SDLRS factor 3 scores. This finding suggests that those with initiative and independence in learning viewed thinking for oneself as a worthwhile activity. Further, those who exhibited initiative and independence in learning believed that learning

requires effort and that intelligence is not static. This finding fits with the research of Dweck and Leggett (1998), whose studies with children found that belief in fixed ability influences motivation and persistence in staying on task. Those with belief in fixed ability do not show independence or persistence when faced with a difficult problem.

SDLRS factor 4, informed acceptance of responsibility for one's learning, was negatively correlated with SEQ factor 2, thinking for yourself is a waste of time ($p<.0001$). SEQ factor 2 accounted for 8.27% of the variance in the SDLRS factor 4 scores. This strong correlation suggests that those students who take responsibility for their own learning value independent thinking.

SDLRS factor 5, love of learning, negatively correlated with SEQ factor 1, the truth is clear and unambiguous ($p<.022$), and SEQ factor 4, knowledge should come quick ($p<0001$). SEQ factors 1 and 4 accounted for 10.76% of the variance in SDLRS factor 5 scores. These negative correlations suggest that those who were more prone to loving learning were less likely to believe that the truth is what Perry (1968) would call Absolute or Truth. Those who love learning are also less likely to believe that learning is quick. There was a positive correlation between SDLRS factor 5, love of learning, and SEQ factor 3, learning does not require effort ($p<0001$). This correlation accounted for almost six percent of the variance in SDLRS factor 5 scores. As reported earlier, one way to interpret this relationship would be to assume that the more that students love learning, the less likely they were to believe that learning requires effort. An alternative interpretation of this correlation is that those who love learning do not find it difficult; therefore, they believe that learning does not require effort. This explanation fits particularly well with this case as those who love learning do not believe that it is quick.

Of course, it would take further study to determine that this interpretation is a plausible one. As stated earlier, a third explanation of this correlation is that Schommer's (1990) hypothesis that epistemological beliefs are more or less independent and that this phenomenon has emerged in this data. According to this hypothesis, it is possible to be sophisticated in one area while remaining naïve in another. It is possible that this particular group of students was epistemologically sophisticated in their beliefs about the certainty of knowledge and about the speed of knowledge acquisition; however, they were naïve in their beliefs about the effort required in the learning process.

SDLRS factor 6, creativity, was positively correlated with SEQ factor 1, the truth is clear and unambiguous ($p<.0001$), and negatively correlated with SEQ factor 2, thinking for yourself is a waste of time ($p<.002$), and SEQ factor 3, learning does not require effort ($p<.030$). These correlations accounted for 8.86% of the variance in the SDLRS factor 6 scores and suggest that the more learners perceive themselves as creative, the more absolute they view the Truth, the more they value independent thought, and the more they believe that the learning process requires effort.

There were no significant correlations between SDLRS factor 7, positive orientation to the future, and SEQ factors. SDLRS factor 8, ability to use basic study skills and problem-solving skills, was negatively correlated with SEQ factors 1, the truth is clear and unambiguous ($p<.0001$), factor 4, knowledge should come quick ($p<.0001$), and SEQ factor 5, intelligence is static ($p<.006$). These negative correlations accounted for 11.96% of the variance in the SDLRS factor 8 scores and suggest that students with

stronger study and problem solving skills are less likely to see truth as absolute, to believe in quick learning, or to believe that intelligence is static.

Research Questions and Self-Directed Learning Readiness Scale Scores as a Function of Epistemological Questionnaire Factor Scores

There were several significant findings in regard to research question number 10, is learner perception of self-directed learning readiness as measured by the SDLRS predicted at a statistically significant level by learner epistemological beliefs as measured by the SEQ and by selected demographic and educational variables? To answer this question, the sample data were analyzed for measures of central tendency and dispersion. Then, a stepwise regression analysis was conducted to extract an equation which includes predictors of SDLRS total scores.

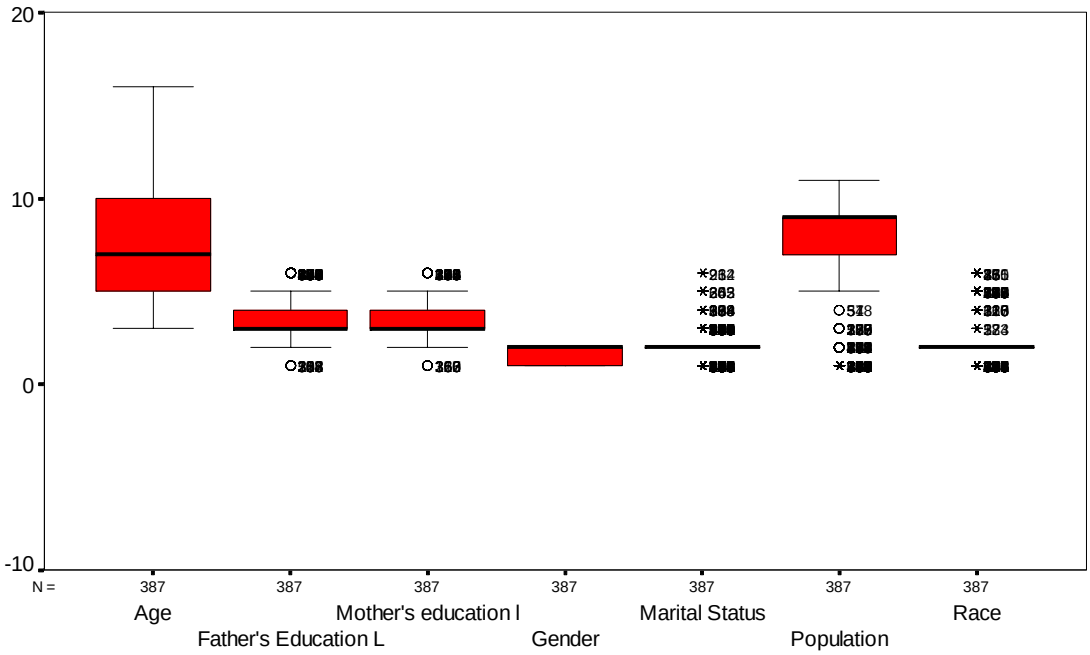
Explorative Boxplots

An explorative boxplot, also known as a box and whiskers plot, is a graphical representation of the distribution of scores, and the boxplot is "helpful in distinguishing between ordinal and normally distributed data" (Morgan, Leech, Gloecker, & Barrett, 2004, p.44). The explorative boxplot for the demographic variables (Figure 17) reveals the presence of outliers, extremes, or both for the variables of father's education level, mother's education level, marital status, rural or urban residence, and race.

The dispersion for age was positively skewed, and father's and mother's education levels were normally distributed with the majority of the respondents reporting that their parents' highest level of education completed was high school. The sample was composed of roughly 41% men and 59% women, and the majority of the sample, 58.1%,

were married, 21.6% were single, 16.5% were divorced, and other groups make up the remainder of the sample. The majority of the sample, 60%, reported living in an urban area, and 74.9% of the sample was Caucasian.

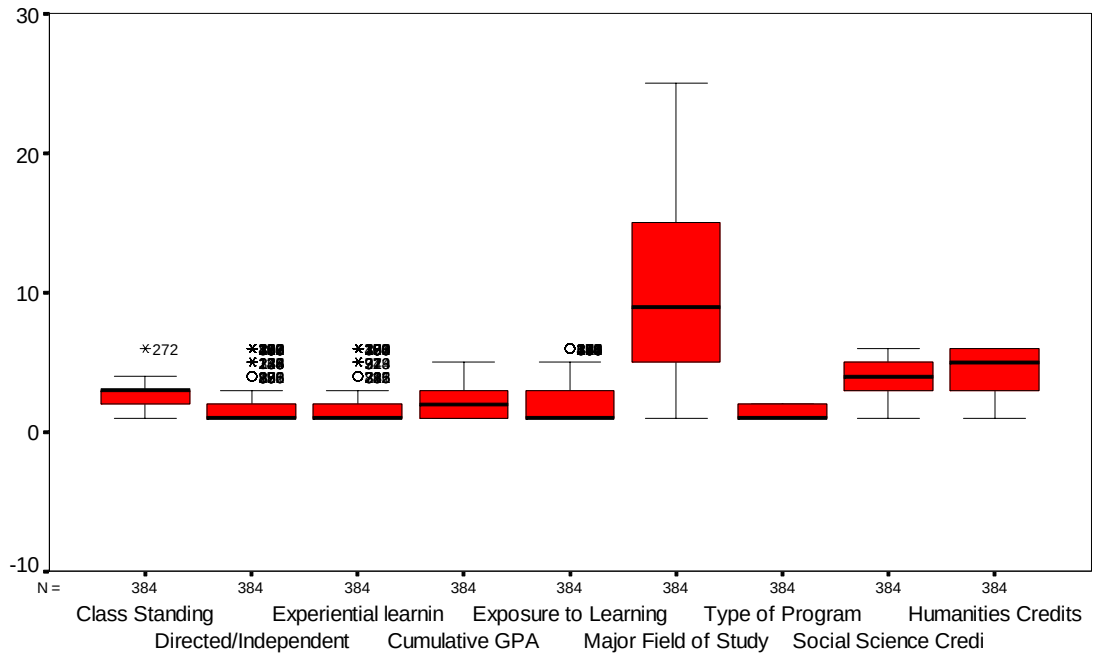
Figure 17
Demographic Variables



The explorative boxplot for the educational variables (Figure 18) reveals the presence of outliers, extremes, or both for the variables of class standing, exposure to independent or directed studies, exposure to experiential learning, and exposure to learning contracts.

The boxplots demonstrate that the dispersion for class standing, exposure to directed studies, exposure to experiential learning, grade point average, and major field of study were positively skewed while the dispersions for humanities credits, social science credits, and exposure to learning contracts were negatively skewed. Type of program was a dichotomous variable (Figure 18).

Figure 18
Educational Variables



The explorative boxplot for the SEQ factors reveals the presence of outliers, extremes, or both for all five factors. The dispersions of all five factors are more or less normally distributed. Factor 1 is slightly positively skewed, factor 2 is slightly negatively skewed, factor 3 is clearly positively skewed, factor 4 is normally dispersed, and factor 5 is slightly negatively skewed (Figure 19).

The explorative boxplot for the Epistemological Questionnaire items reveals the presence of outliers, extremes, or both for most of the items (Figure 20).

Figure 19
Epistemological Questionnaire Factors

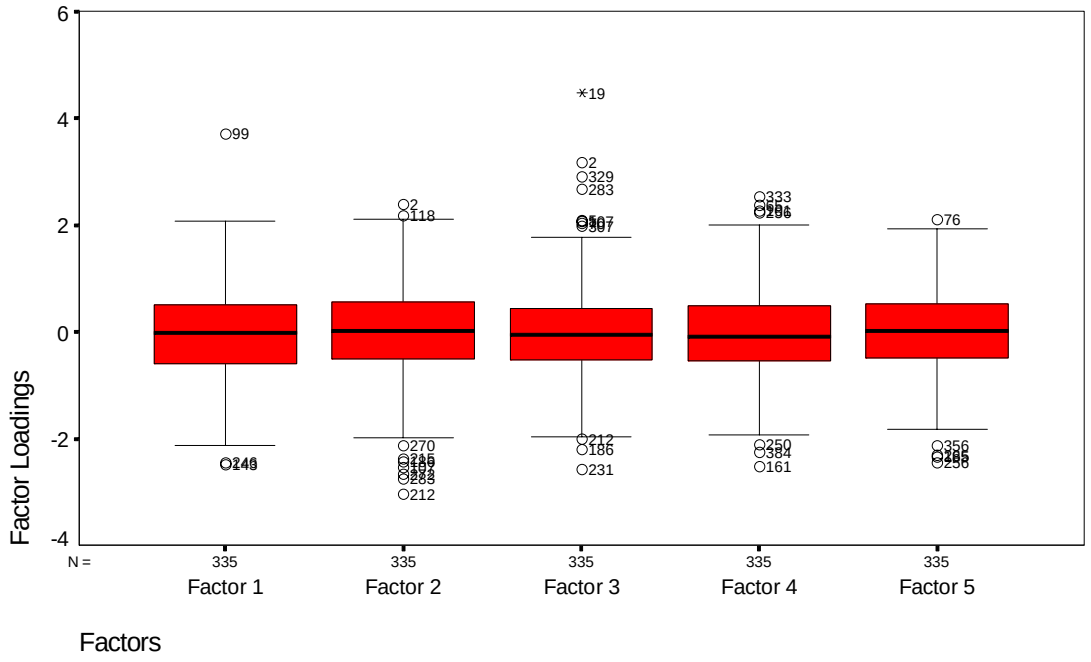
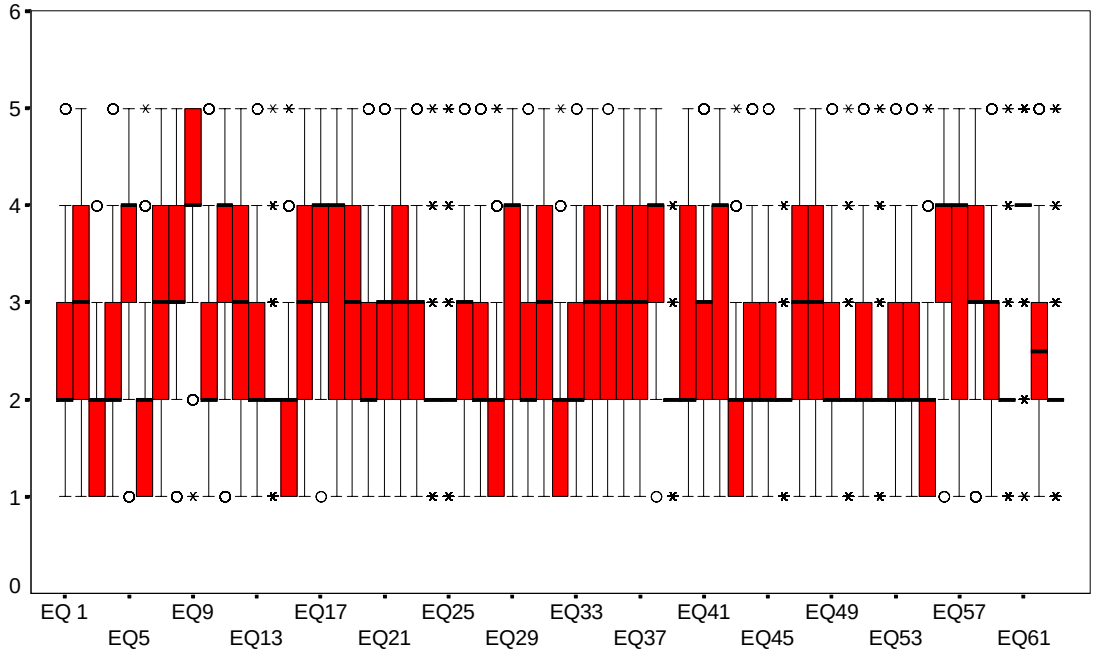
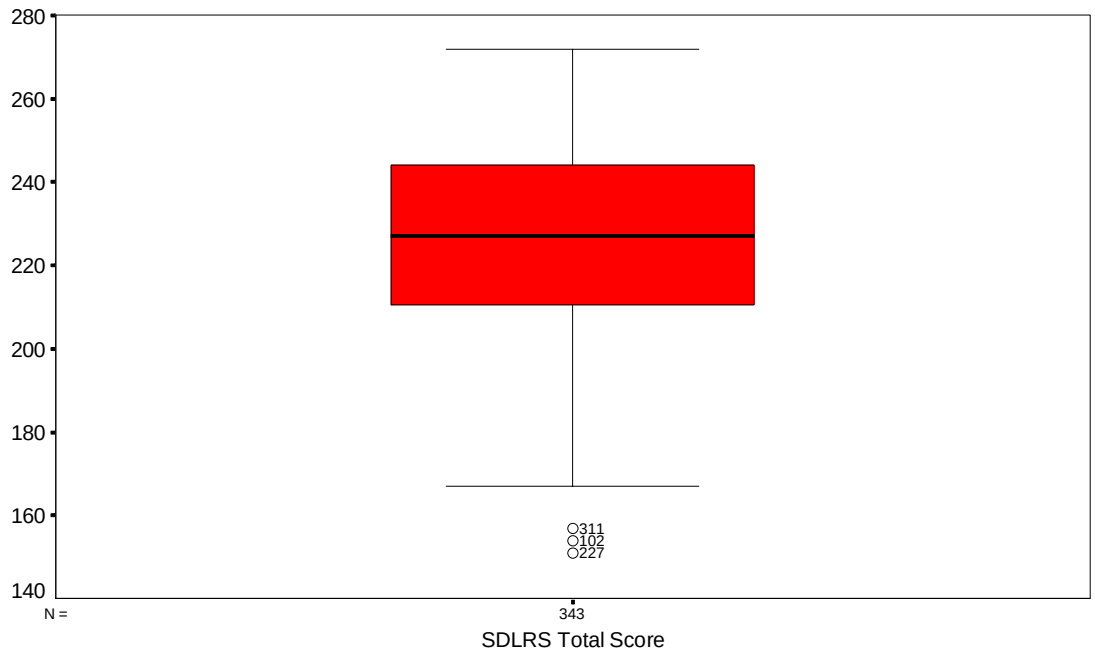


Figure 20
Epistemological Questionnaire Items



The explorative boxplot for the SDLRS total score reveals the presence of extremes and outliers. The distribution of SDLRS total scores was negatively skewed (Figure 21).

Figure 21
SDLRS Total Scores



Stepwise Multiple Regression

After determining relatively normal distributions of the variables, significant findings from the correlations of demographic and educational variables, SEQ factors, and SDLRS total scores were entered into a stepwise multiple regression. No demographic variables were significantly correlated with the SDLRS total scores; consequently, none of these items were entered into the regression equation. The educational factors with the strongest correlations ($p<.002$) to SDLRS total scores were selected for entry into the equation. These factors included: exposure to the humanities ($p<.001$), exposure to the social sciences ($p<.001$), and class standing ($p<.002$). All SEQ

factors that were significantly correlated to the SDLRS total scores were entered into the regression equation. These included: SEQ factor 2, thinking for yourself is a waste of time ($p<.0001$), factor 4, knowledge should come quick ($p<.0001$), and factor 5, intelligence is static ($p<.033$).

In Table 23, the means, standard deviations, and intercorrelations can be found. When the combination of variables to predict SDLRS total scores included class standing, SEQ factor 2, thinking for yourself is a waste of time, SEQ factor 4, knowledge should come quick, and SEQ factor 5, intelligence is static, $F (4, 292)=26.66$, $p<.0001$.

Table 23
Stepwise Multiple Regression of Educational Variables and Epistemological Questionnaire Factors Predicting SDLRS Total Scores

Var.	Mean	SD	Human.	Soc. Sci.	Class	SEQ 2	SEQ 4	SEQ 5
SDLRS Total	226.475	24.721	.214***	.200***	.215***	-.364***	-.320***	-.115*
Hum.	4.310	1.572	--	.616***	.476***	-.218***	-.143**	.067
Soc. Sci.	3.650	1.338		--	.529***	-.135**	-.019	.038
Class	2.653	1.002			--	-.108*	-.057	.133*
SEQ 2	-.022	.892				--	.029	.005
SEQ 4	.025	.838					--	.062
SEQ 5	-.006	.793						--

*p<.05. ** p<.01. ***p<.001

The beta coefficients are presented in Table 24. The variable of class standing was positively correlated with SDLRS total score, suggesting that as students advanced in class standing, they became increasingly self-directed. The factors from the SEQ

instrument were negatively correlated with the SDLRS total scores. This finding is to be expected because the factors are stated in such a way that a naïve person would agree with them. This finding suggests that the more students agreed with the naïve statements, the less self-directed they perceived themselves to be.

Table 24
Stepwise Multiple Regression Analysis Summary for Educational Variables and Epistemological Questionnaire Factors Predicting SDLRS Total Scores

Variable	B	SE B	95% Confidence Interval	Interval B	Beta
SEQ Factor 2	-9.306818	1.397300	-12.056875	-6.556761	-.335687
SEQ Factor 4	-8.625444	1.484398	-11.546920	-5.703969	-.292300
SEQ Factor 5	-3.701938	1.579671	-6.810923	-.592954	-.118744
Class Standing	4.390286	1.256672	1.917003	6.863568	.177975
(Constant)	214.818429	3.556598	207.818613	221.818246	

The Multiple R for this equation was .51724, and the adjusted R^2 was .257. This indicates that 25.7% of the variance in SDLRS total scores was explained by the model. According to Cohen (1988) and Morgan, Leech, Gloeckner, and Barrett (2004), this is larger than typical effect.

The finding from this analysis speaks to the primary research question for this study, does a relationship exist between demographic factors, educational factors, learner perception of self-directedness, and learner epistemological beliefs? If so what is the nature of this relationship? The findings from this analysis suggest that of all the

variables included in the study, the educational variable of class standing and three factors from the SEQ are the strongest predictors of self-directed learning readiness. This finding, along with the correlational data, suggest that there are many significant correlations between epistemological beliefs and learner perception of self-directedness.

Summary

The findings from these statistical analyses provide some insight into the research questions and suggest that there are several significant relationships between demographic factors, educational factors, learner perception of self-directedness, and learner epistemological beliefs.

The sample was composed of students enrolled in the PACE and DCP programs at Friends University in Wichita, Kansas (N=394). The majority of the sample was composed of first-generation, married Caucasian participants between the ages of 35 and 45 years old. The sample included students from various class standings and major fields of study. The majority of these students reported limited exposure to experiential learning, independent or directed studies, and utilizing learning contracts. Over half the sample had earned four or more credits in the humanities and in the social and behavioral sciences, and 73.4% reported a cumulative grade point average of 3.2 or higher.

For this sample, the SEQ produced five factors, factor 1, the truth is clear and unambiguous, factor 2, thinking for yourself is a waste of time, factor 3, learning does not require effort, factor 4, knowledge should come quick, and factor 5, intelligence is static. The SDLRS produced eight factors, factor 1, openness to learning opportunities, factor 2, self-concept as an effective learner, factor 3, initiative and independence in learning, factor 4, informed acceptance of responsibility for one's own learning, factor 5, love of

learning, factor 6, creativity, factor 7, positive orientation to the future, and factor 8, ability to use basic study skills and problem-solving skills.

When the data were analyzed to detect correlations in demographic and educational variables and SDLRS total scores, no demographic variables were significant. However, there were several significant correlations between educational variables and SDLRS total scores. The variables of class standing, grade point average, exposure to the humanities, and exposure to learning contracts accounted for about 10% of the variance in total SDLRS scores. These variables were later used in a regression equation to predict SDLRS total scores.

Likewise, there were several significant correlations between demographic variables and SDLRS factor scores. Factor 1, openness to learning opportunities, was correlated with age, gender, race, exposure to the humanities and utilization of learning contracts. Factor 2, self-concept as an effective, independent learner, was correlated with gender, class standing, exposure to the humanities, exposure to the social sciences, credits earned through independent or directed studies, credits earned through experiential learning, and type of program. Factor 3, initiative and independence in learning, and factor 4, informed acceptance of responsibility for one's own learning, were correlated with age, gender, class standing, and exposure to the social sciences while factor 5, love of learning, was not significantly correlated with any demographic variables. Factor 5 was correlated with grade point average, class standing, exposure to the humanities, and exposure to the social sciences. Factor 6, creativity, was correlated with mother's and father's education levels, class standing, and type of program, and factor 7, positive orientation to the future, was not correlated with any of the demographic or educational

variables. Factor 8, ability to use basic study skills and problem-solving skills, was correlated with marital status and type of program.

When the data were analyzed to detect correlations between demographic and educational variables and the SEQ factors, there were many significant findings. Factor 1, the truth is clear and unambiguous, was correlated with gender, race, exposure to the humanities, exposure to the social sciences, and grade point average. Factor 2, thinking for yourself is a waste of time, was correlated with marital status, class standing, exposure to the humanities, and exposure to the social sciences. Factor 3, learning does not require effort, was correlated with age, gender, marital status, type of program, and father's education level. Factor 4, knowledge should come quick, was correlated with age, marital status, and exposure to the humanities. Factor 5, intelligence is static, was correlated with race, type of program, and marital status.

There were several significant correlations between SEQ factors and SDLRS factors. SDLRS factor 1, openness to learning opportunities, was correlated with three factors from the SEQ, thinking for you is a waste of time, learning does not require effort, and knowledge should come quick. SDLRS factor 2, self-concept as an effective learner, was correlated with two factors from the SEQ, thinking for yourself is a waste of time, and learning does not require effort. SDLRS factor 3, initiative and independence in learning, was correlated with three factors from the SEQ, thinking for yourself is a waste of time, learning does not require effort, and intelligence is static. SDLRS factor 4, informed acceptance of responsibility for one's own learning, was correlated with one factor from the SEQ, thinking for yourself is a waste of time. SDLRS factor 5, love of learning, was correlated with three factors from the SEQ, the truth is clear and

unambiguous, knowledge should come quick, and learning does not require effort. SDLRS factor 6, creativity, was correlated with three SEQ factors, the truth is clear and unambiguous, thinking for yourself is a waste of time, and learning does not require effort. There were no significant correlations between SDLRS factor 7, positive orientation to the future, and SEQ factors, and SDLRS factor 8, ability to use basic study skills and problem-solving skills, was correlated with three SEQ factors, the truth is clear and unambiguous, knowledge should come quick, and intelligence is static.

When the data were analyzed to detect correlations between the SEQ factors and SDLRS total scores, there were three significant factors, SEQ factor 2, thinking for yourself is a waste of time, SEQ factor 4, knowledge should come quick, and SEQ factor 5, intelligence is static. These factors, along with significant demographic and educational variables, were utilized in a regression equation to predict SDLRS total scores.

The regression analysis included a combination of variables to predict SDLRS total scores. The significant variables included: class standing, SEQ factor 2, thinking for yourself is a waste of time, SEQ factor 4, knowledge should come quick, and SEQ Factor 5, intelligence is static. This equation accounted for 25.7% of the variance in SDLRS total scores and the Multiple R for this equation was.51724, a larger than typical effect. A detailed discussion of the conclusions and implications of the findings of this research are presented in Chapter 5.

CHAPTER 5

Introduction

This chapter includes a summary of the design of this study, the research questions, and the findings. The findings of the study are discussed in detail and are related to the self-directed learning, cognitive development, and personal epistemology literatures. This chapter also includes recommendations for further research, recommendations for the improvement of practice, and implications of the study.

Summary of the Study

This study investigated the relationship between demographic and educational variables as measured by the Demographic and Educational Questionnaire, learner epistemological beliefs as measured by Schommer's Epistemological Questionnaire (SEQ), and learner perception of self-directed readiness as measured by the Self-Directed Learning Readiness Scale (SDLRS). The population (N=394) consisted of students enrolled during the spring 2005 semester in the two year associate's degree in general studies program (PACE) and in the cohort-based bachelors degree completion programs (DCP programs) at Friends University in Wichita, Kansas.

Research Questions

The research questions for this study emerged out of an extensive review of the adult education, self-directed learning, cognitive development, and personal epistemology literatures.

Primary Research Question

1. Does a relationship exist among demographic variables, educational variables, learner perception of self-directedness, and learner epistemological beliefs? If so, what is the nature of this relationship?

Secondary Research Questions

2. Is there a statistically significant relationship between learner perception of self-directedness as measured by the Self-Directed Learning Readiness Scale (SDLRS) and the demographic variables of age, gender, race, marital status, parents' education level, and rural or urban residence?
3. Is there a statistically significant relationship between learner perception of self-directedness as measured by the SDLRS and educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program?
4. Is there a statistically significant relationship between the factors outlined in the SDLRS—openness to learning opportunities; self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, positive orientation to the future, and ability to use basic study skills and problem-solving skills—and the demographic variables of age, gender, race, marital status, parents' education level, and rural or urban residence?

5. Is there a statistically significant relationship between the factors outlined in the SDLRS—openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, positive orientation to the future, and ability to use basic study skills and problem-solving skills—and the educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program?
6. Is there a statistically significant relationship between the factors outlined in the Schommer Epistemological Questionnaire (SEQ)—the truth is clear and unambiguous, thinking for yourself is a waste of time, learning does not require effort, knowledge should come quick, and intelligence is static—and the demographic variables of age, gender, race, marital status, parents' education level, and rural or urban residence?
7. Is there a statistically significant relationship between the factors outlined in the SEQ—the truth is clear and unambiguous, thinking for yourself is a waste of time, learning does not require effort, knowledge should come quick, and intelligence is static—and the educational variables of class standing, grade point average, major field of study, exposure to the liberal arts, exposure to self-directed learning, exposure to experiential learning, and type of program?
8. Is there a statistically significant relationship between learner perception of self-directedness as measured by the SDLRS and learner epistemological beliefs as measured by the SEQ?

9. Is there a statistically significant relationship between the factors outlined in the SEQ—the truth is clear and unambiguous, thinking for yourself is a waste of time, learning does not require effort, knowledge should come quick, and intelligence is static—and the factors outlined in the SDLRS—openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, positive orientation to the future, and ability to use basic study skills and problem-solving skills?
10. Is learner perception of self-directed learning readiness as measured by the SDLRS predicted at a statistically significant level by learner epistemological beliefs as measured by the SEQ and by selected demographic and educational variables?

Findings

The findings from the statistical analyses provide some insight into the relationships hypothesized in the research questions. The findings suggest that for this sample, there were several significant relationships between demographic factors, educational factors, epistemological beliefs, and learner perception of self-directed readiness.

The data were initially analyzed to describe measures of central tendency and dispersion. The data were then analyzed to detect correlations between demographic and educational variables and SDLRS total scores, SDLRS factors scores, and SEQ factor scores. The data were also analyzed to detect correlations between SEQ factors and SDLRS total scores and SDLRS factor scores. There were several significant findings in

the correlational analyses. The most significant findings from the correlational analyses were utilized in a regression equation to predict SDLRS total scores. This equation accounted for 25.7% of the variance in SDLRS total scores.

Discussion of Correlations

The correlations found in this study offer insight into the relationships between demographic and educational variables, epistemological beliefs, and learner perception of self-directedness. Interpretation of the findings fleshes out the nature of these relationships, and these findings lend themselves to both offering suggestions for practice and to distilling questions for further research.

Some of the most interesting findings for this study were the correlations between educational variables and SEQ factor scores and SDLRS total and factor scores. The educational variables class standing, exposure to the humanities, and exposure to the social sciences significantly correlated with at least five SDLRS and SEQ total and factor scores. This finding indicates that these are important variables in understanding the relationships between epistemological beliefs and learner perception of self-directedness. There were also some very interesting findings in the correlations between SDLRS and SEQ factor scores.

Class Standing

The positive correlation of class standing with SRLRS total scores suggests that as students in this sample progressed in class standing, they became more self-directed. Similarly, the positive correlations with SDLRS factor 1, openness to learning opportunities, SDLRS factor 4, informed acceptance of responsibility for one's own learning, and SDLRS factor 5, love of learning, suggests that as students progressed in

class standing, they became more open to learning opportunities, appreciated learning more, and become more responsible for their own learning. The negative correlation of class standing with SEQ factor 2, thinking for yourself is a waste of time, suggests that as students progressed in class standing, the more likely they were to value thinking for themselves and intellectual autonomy.

These correlations support various concepts presented in the self-directed learning and personal epistemology literatures. The significance of informed acceptance of responsibility for one's own learning is consistent with the work of many who have studied personal responsibility as an element of self-directedness (Brockett & Hiemstra, 1991; Candy, 1991; Garrison, 1997; Guglielmino, 1977).

The correlation of class standing with SDLRS total and factor scores and SEQ factor 2, thinking for yourself is a waste of time, connects class standing with aspects of self-directedness and with the research on personal epistemology. In Perry's (1968) original study, Perry hypothesized that as students move through the educational process, they develop from positions of dualism, to multiplicity, to relativism, and finally to commitment in relativism. In the early stages, students are dependent upon external Authority for Truth, and as students develop toward commitment in relativism, they come to trust themselves as an internal source of authority. The correlations of class standing and the factors in this study suggest that as students move forward in class standing, they become more self-directed, more open to learning opportunities, more responsible for their own learning, and more prone to think for themselves. This finding is consistent with the findings of other research in the self-directed learning literature (Kasworm, 1997; Leeb, 1983; Palumbo, 1990; Shaw, 1987).

This combination of factors (advancement in class standing correlated with self-directedness and epistemic sophistication) suggests that as students from this sample progressed in class standing, they were less dependent on authority to provide the answers. These findings lend support to the hypotheses of Leeb (1983) and Mentkowski et al. (2000) that as individuals move away from dualist thinking, there will be an increase in learner perception of self-directedness. More study into the intricacies of these connections would solidify this exploratory finding.

The remaining correlations of class standing and SDLRS and SEQ factors are counterintuitive findings not readily supported by the literature. This situation perhaps makes these findings just as interesting in their implications as the ones previously mentioned. For this sample, SDLRS factor 6, creativity, was negatively correlated with class standing, and SEQ factor 3, learning does not require effort, was positively correlated with class standing. These findings suggest that as students moved forward in class standing, they were less likely to perceive themselves as creative, and they were less likely to hold the epistemological belief that learning requires effort. These findings suggest that as students advance in class standing, they actually digress developmentally in regard to creativity and perception of learning. While one could forge many guesses as to what these findings might imply, this phenomenon would require more study before any complete theories could be expounded.

Exposure to the Humanities

The positive correlation of exposure to the humanities with SRLRS total scores suggests that as students in this sample completed more hours in the humanities, they became more self-directed. Further, the positive correlation of exposure to the humanities

with SDLRS factor 1, openness to learning opportunities, SDLRS factor 2, self-concept as an effective learner, and SDLRS factor 5, love of learning suggests that increased exposure to the humanities encourages openness to learning activities, builds self-confidence in learners, and fosters a love of learning.

The negative correlations of exposure to the humanities with SEQ factor 1, the truth is clear and unambiguous, SEQ factor 2, thinking for yourself is a waste of time, and SEQ factor 4, knowledge should come quick, suggests that increased exposure to the humanities promotes the epistemological belief that knowledge is contextual and subjective, the belief that thinking for oneself is important, and the belief that the knowledge acquisition process takes time.

Many models of personal epistemology, such as King and Kitchener's (1994) model of reflective judgment and the developmental model posed in Baxter Magolda's (1998) work, stressed the importance of contextual knowing and outlined the progression from absolute knowledge, to transitional knowing, to independent knowing. Further, other models of personal epistemology, such as the one posed by Belenky et al. (1986) dealing with gender, stressed the importance of subjectivism. The correlations in this study suggest that increased exposure to the humanities is one means to promote sophisticated epistemological beliefs. The correlations with this variable not only suggest that increased exposure in the humanities is one means to promote love of learning, to build self-confidence in learning, and to encourage openness to learning opportunities, but these correlations also suggest that this exposure moves students away from absolute knowledge and dependence upon Authority for the Truth. This finding is consistent with

those of Mentkowski et al. (2000) who concluded that a student can develop breadth of perspective through exposure to a liberal arts curriculum.

Exposure to the Social Sciences

The positive correlation of exposure to the social sciences with SRLRS total scores suggests that as students in this sample completed more hours in the social sciences, they became more self-directed. The positive correlation of exposure to the social sciences with SDLRS factor 1, openness to learning opportunities, SDLRS factor 2, self-concept as an effective learner, and SDLRS factor 5, love of learning suggests that, like exposure to the humanities, increased exposure to the social sciences encourages openness to learning activities, builds self-confidence in learners, and fosters a love of learning.

The negative correlations of exposure to the social sciences with SEQ factor 1, the truth is clear and unambiguous, and SEQ factor 2, thinking for yourself is a waste of time, suggests that increased exposure to the social sciences promotes the epistemological belief that knowledge is contextual and subjective and the belief that thinking for oneself is important. Like exposure to the humanities, for this sample exposure to the social sciences promoted divergent thinking, epistemic growth, and self-directedness.

Exposure to Learning Contracts

Exposure to learning contracts was positively correlated with the SDLRS total scores and SDLRS factor 1, openness to learning opportunities. This finding suggests that for this sample, exposure to learning contracts increased learner willingness to engage in learning activities and the overall perception of self-directedness. This finding confirms much of what has been written about learning contracts. In the practioner literature, there

are many proponents of learning contracts (Berte, 1975; Chiang, 1998; Cristiano, 1993; Johnson, Wurr, & Edwards, 1995; Leith, 1997; Schraeder, 1996; Vitucci, 1992). Kasworm (1992) claimed that learning contracts assist adult learners in becoming more proactive. Kasworm contended, "We need to assist adult learners in becoming more proficient and effective in their own learning process" (p. 72). Kasworm also suggested that teachers have a greater impact when they provide the learners with tools to learn over a lifetime as opposed to providing a "one shot, learning experience of knowledge that will be obsolete in the future" (Kasworm, 1992, p. 72). Other researchers agreed with this assessment of learning contracts. Marshall and Null (1992) pointed out that the learning contract is "a powerful mechanism" for holding together what has been learned, how it was achieved, and how that learning will be evaluated.

Type of Program

The findings in regard to program type were very interesting. The positive correlations of program type with SDLRS factor 6, creativity, and SDLRS factor 8, ability to use basic study skills and problem-solving skills, suggest that those students in cohort groups were more likely than other students to see themselves as creative and able to solve problems. Similarly, the negative correlations of program type with SEQ factor 3, learning does not require effort, and SEQ factor 5, intelligence is static, indicated that those enrolled in the cohort groups were less likely to believe in fixed ability or in effortless learning. Nevertheless, these findings are contradicted by the strong negative correlation of program type and SDLRS Factor 2, self-concept as an effective learner. In this finding, those enrolled in cohort groups were less likely to see themselves as effective learners. Also, the finding on creativity is in direct conflict with the finding on

class standing and creativity. In this particular sample, those enrolled in cohort groups were all upperclassmen. Because of the breakdown of the sample and the kinds of programs the students were enrolled in, these findings are confounded with class standing. However, these conflicting findings are nevertheless interesting, and further study is warranted into the epistemic sophistication and self-directedness of cohort groups as opposed to groups in other learning situations.

Epistemological Questionnaire Factors and SDLRS Factors

An examination of the correlations between the SEQ factors and the SDLRS factors helps to describe and to name the relationships that were uncovered between epistemological beliefs and learner perception of self-directedness. Examining the SEQ factors across the SDLRS factors serves as a reminder of how pervasively epistemological beliefs can affect other beliefs, such as the perception of self-directedness. Also, examining the factors separately allows for reflection on Schommer's hypothesis that dimensions of epistemological beliefs are more or less independent and can function independently of one another. In other words, it is quite possible, if not probable, that one can be more epistemologically sophisticated in one dimension than in another.

SEQ factor 1, the truth is clear and unambiguous, was negatively correlated with the SDLRS factor 5, love of learning, and with SDLRS factor 8, the ability to use basic study skills and problem solving skills. This correlation suggests that for this sample, those who held a view of the Truth as Absolute were less likely to enjoy learning or to possess basic study and problem solving skills. This finding is consistent with other studies, particularly with the work of King and Kitchener (1994), whose three-level

model of cognitive processing was based on how individuals solve ill-structured problems, and with Schommer's work (Schommer, 1989a, 1989b, 1990, 1993b,1994; Schommer et al., 1992), which found connections between epistemic beliefs about the nature of knowledge and learning and academic performance. This finding suggests that the act of discovering or inventing knowledge (or truth) is a factor that is pleasurable in such a way that it influences overall love of learning. The implication for practice is that those students with a view of the truth as clear and unambiguous will be less invested in learning and the learning process; therefore, these students will be less likely to be ready to engage self-directed activities.

SEQ factor 2, thinking for yourself is a waste of time, was significantly negatively correlated with five SDLRS factors. The correlations of these factors suggest that those with the naïve view that thinking for oneself is a waste of time were less likely to be open to learning opportunities, were less likely to see themselves as effective learners, were less likely to show independence and initiative in learning, were less likely to take responsibility for their own learning, and were less likely to view themselves as creative. This finding is consistent with the previous findings in Schommer's work that belief in certain knowledge, simple knowledge, and quick learning predict academic performance as measured by reading comprehension scores and grade point average (Schommer, 1990, 1993b, 1994; Schommer et al., 1997). This finding has far-reaching implications for practice as these naïve epistemological beliefs could affect a student's self-directedness via self-esteem, willingness to try new tasks and to take charge of and responsibility for his/her own learning, and ability to see learning as a creative endeavor.

SEQ factor 3, learning does not require effort, was negatively correlated with three SDLRS factors, factor 1, openness to learning opportunities, factor 3, initiative and independence in learning, and factor 6, creativity. These findings suggest that students in this sample who did not believe that learning requires effort were not open to learning opportunities, did not demonstrate initiative and independence in learning, and did not see themselves as creative. This finding is consistent with Schommer's previous research, particularly the studies that suggest that epistemological beliefs influence study skills (Schommer et al., 1992).

SEQ factor 4, knowledge should come quick, was negatively correlated with three SDLRS factors, factor 1, openness to learning opportunities, factor 5, love of learning, and factor 8, ability to use basic study skills and problem solving skills. These findings suggest that students in the sample who believed in quick learning were less likely to seek opportunities to learn, were less likely to report that they love learning, and were less likely to possess basic study skills and problem-solving skills. The findings about belief in quick learning are consistent with the works of Perry (1968), Schoenfeld (1983, 1985), and Schommer (1989a, 1989b, 1990, 1993b) which found that the epistemological belief in quick learning indicates a low level of epistemological development. This study found that this unsophisticated epistemological belief that knowledge should come quick affected important dimensions of learner self-directedness.

SEQ factor 5, intelligence is static, was negatively correlated with two SDLRS factors, factor 3, initiative and independence in learning, and factor 8, ability to use basic study and problem-solving skills. This finding suggests that those who believed in fixed ability were less likely to show independence and initiative in learning and were less able

to utilize problem-solving and study skills. This finding is consistent with Dweck & Leggett's (1988) work on belief in fixed ability and with Schommer's (1989a, 1989b, 1990) research. This findings suggests that in practice those students with the epistemological belief that intelligence is static will be less self-directed because of a lack of initiative in learning coupled with a lack of appropriate study and problem-solving skills.

Multiple Regression and Predictors of Learner Perception of Self-Directed Readiness

The significant findings from the correlations of demographic and educational variables and SEQ factors with SDLRS total scores were entered into a stepwise multiple regression equation. The significant predictors of SDLRS total scores were: class standing, SEQ factor 2, thinking for yourself is a waste of time, SEQ factor 4, knowledge should come quick, and SEQ factor 5, intelligence is static. One educational variable and three SEQ variables predicted SDLRS total scores at a level of significance of $p<.0001$, and these four variables accounted for 25.7% of the variance of total SDLRS scores.

The finding of class standing as a significant factor is supported by Schommer's (1994) study which suggested that epistemological beliefs are influenced by educational and personal experiences, and these beliefs change over time. Similarly, Sabbaghian's (1979) study found a positive relationship between years of formal education and four of the eight SDLRS factors, and Cunningham's (1989) study found that students advanced in class standing reported a higher perception of self-directedness than students less advanced in class standing. Likewise, the factors of quick learning and innate ability have

been significant in several of Schommer's studies (1989a, 1989b, 1990, 1993b, 1994; Schommer et al., 1997).

The factors in the regression equation clarify the relationship between epistemological beliefs and learner self-directedness. The findings in this research fit with, reinforce, connect, and elaborate on previous findings in the self-directed learning, cognitive development, and personal epistemology literatures. The regression finding suggests that there are clearly correlations between educational variables, epistemological beliefs, and learner perception of self-directedness, and these correlations can be used to predict learner perception of self-directed readiness. In addition to predicting self-directed readiness, these variables can be used as developmental guideposts in practice. Working toward the goal of developing epistemic sophistication, for example, will also improve overall learner self-directedness.

Recommendations for Further Research

Based on the results of this exploratory study, the following suggestions for future research are offered:

1. The participants in this study were mostly a homogeneous group of adult students from the Midwest. A study with a similar design to this one should be conducted with other demographic and educational groups to see if there are similar results. Currently, researchers at Wichita State University and Friends University are replicating this study with traditionally aged undergraduate students and graduate students. The results of this dissertation research and these follow-up studies will be reported at the 12th International Conference

on Learning in Granada, Spain in July 2005. Further studies with other groups are strongly suggested.

2. Because of the clear existence of five factors with this sample and the criticisms in the literature of Schommer's choice of reporting on the SEQ factors generated from the subsets rather than individual items (Clarebout et al., 2001; Hofer & Pintrich, 1997), future studies of the SEQ with other populations should analyze the 58 items to validate the existing factor structure or to explore whether the five factor structure of this study is replicated with other groups. If the five factor structure is replicated, then the instrument should be revised to include factors based on item correlations rather than on the twelve subsets.
3. This study did not measure how epistemological beliefs develop over time. It makes sense that a useful study would be a longitudinal examination of how epistemological beliefs and self-directedness change over time and with increased exposure to formal higher education. Ideally, this future study would include both quantitative and qualitative measures of epistemological sophistication and self-directedness over time.
4. The finding that advanced class standing correlates with diminished creativity and with the naïve epistemic belief that learning does not require effort needs to be studied more closely. It is possible that this finding represents a developmental stage, like some of those positions in the Perry (1968) scheme, which are temporary states. If this is a common developmental occurrence, a

follow-up study could explore how and why this developmental phenomenon occurs.

5. The above average SDLRS total scores indicated that this sample was composed of a large number of self-directed students. It is possible that these students have persisted in programs designed for adult students due at least in part to their self-directed skills. There needs to be a study on attrition in programs for adult students to see what effect, if any, learner self-directedness and epistemological sophistication have on success and persistence.
6. For many of the factors and variables in this study, there were outliers, extremes, or both. A qualitative follow-up study with those who were outliers or extreme cases would help in developing an understanding of the incidences of extreme cases and in identifying other factors affecting epistemological sophistication and self-directedness. A study such as this might also help identify subtle variables that were difficult to detect with a quantitative design.
7. The literature on self-directed learning includes studies of instructor perception of self-directedness compared with the students' perceptions of self-directedness (Long & Ageykum, 1988). A study of faculty members' epistemological beliefs and perception of self-directed readiness compared with the students' SEQ and SDLRS scores is one way to investigate how faculty perceptions influence the beliefs of their students.
8. The conflicting findings in this study warrant investigation into the epistemological beliefs and self-directed readiness of those students enrolled in cohort and non-cohort programs. A study of self-directed learning and

epistemological beliefs treating the cohort and non-cohort groups as separate populations would give interesting information about the effects of program type on these two variables. Previous studies, such as those of Wlodkowski, Mauldin, and Campbell (2002) suggest there are differences between cohort and non-cohort groups.

9. A future study might include the current career and the career aspirations of the participants to see if any domain specific patterns emerge in the data. This study would contribute to the literature on the domain specificity or domain generality of epistemological beliefs (Fishback, 1997; Schommer & Walker, 1997; Sternberg, 1989) and self-directedness.
10. A qualitative study focusing on the effect of personal micro-culture and personal influences, such as family support, friendship, religious affiliation, and other variables would give insight into how individual differences influence epistemic growth and learner perception of self-directedness.

Recommendations for the Improvement of Practice

Based on the results of this study, the following recommendations for the improvement of practice are offered:

1. The results of this study indicate that students with more hours in the humanities and social sciences are more epistemologically sophisticated and more self-directed than those with fewer hours in these fields. Universities and colleges espousing the outcomes of problem solving abilities and self-directedness should require a general education core of courses that includes a

substantial amount of coursework in the humanities and social sciences. Kegan (1994) pointed out that

> intellectual disciplines . . . are . . . systematic procedures for generating and evaluating ideas, hypotheses, and sincere opinions. Taking charge of a discipline, as higher education asks its students to do, requires more than just the personal "sophistication of self-direction." It requires the cognitive sophistication to construct complex systems, the structure of the fourth order. (286)

The more coursework students have in the humanities and social sciences, the more likely that they will learn the skills to meet the demands of the classroom, the workplace, and contemporary society.

2. Work toward building a culture in adult higher education that supports epistemic growth and learner self-directedness. Programs for adult students should be marketed and delivered in ways that extend beyond credentialing. This assumption should be utilized both inside the university's systems of curriculum development, outcomes development, and assessment as well as outside of the academic realm in marketing and published materials. Programs need to operate with a self-awareness that students change and grow throughout the educational process. The educational environment needs to change and grow with the students. The university culture needs to be one of acknowledging epistemic and self-directed growth when it occurs. Students need to be given opportunities to reflect on their growth and development and to make meaning of the educational process and the changes in their lives and

perspectives. The university marketing information, catalog of courses, web site, and other official sources of information need to include statements such as “We believe that intelligence is improved through education,” “We believe that different individuals have different learning needs and learn at different speeds,” and “We believe in teaching students so that they can value thinking for themselves.”

3. Another means to build a university culture supporting epistemic growth and self-direction is to state that these qualities are important in all of the university materials—from marketing tracks to formal statements of outcomes. The faculty should overtly discuss and promote learner self-direction, problem solving, abstract thinking, and subjective knowing. These characteristics should be intertwined though university, college, program, departmental, and course outcomes. In order for these outcomes to be reinforced for students and faculty alike, they should be promoted from the marketing process, throughout the program, to graduation, and beyond graduation from the university.
4. Based on the significant items and factors of this study and subsequent studies, an abbreviated instrument to measure epistemological sophistication and learner self-directedness needs to be developed. This instrument might also include other variables, such as self-regulation, which has been linked to persistence in adult education (Wlodkowski et al., 2002). The scores on this instrument could be utilized to place students into more or less accelerated and/or self-directed learning programs.

5. Intentionally develop a curriculum that moves students toward the goals of self-directedness and epistemological sophistication. This curriculum should be designed to help students move from what Kegan would call the third to the fourth order of consciousness. In practice, this would include increasing student involvement in learning through utilizing case studies, role playing, interview projects, team data-gathering projects, learning communities, and opportunities for critical self-reflection (Moore, 1994).
6. Attend to the social context in adult education settings. Many studies (Brockett & Hiemstra, 1991; Brookfield 1985a; Kasworm et al., 2002; Wlodkowski et al., 2002) pointed out the importance of the social context in learner success and self-directedness. Kasworm et al. advocated the creation of learning communities that easily integrate with students' lives that extend beyond the educational setting to work, family, home, and community. The creation of communities will assist students, particularly those who are less epistemologically sophisticated and less self-directed, to develop what Kasworm would explain as a more developed voice in regard to academic programming.
7. Structure courses and curriculum based on the idea that epistemological beliefs are more or less independent. Structure the course and design learning experiences to develop particular beliefs regarding the nature of the truth, the usefulness of critical thought, the effort required to learn, the nature of knowledge, and the notion of fixed ability. One way to do this is to utilize Lynch and Wolcott's (2001) steps for better thinking to address open-ended

academic, personal, professional, and civic problems. Lynch and Wolcott's steps include: step 1, identify the problem, relevant information, and uncertainties; step 2, explore and interpret connections; step 3, prioritize alternatives and communicate conclusions; and step 4, integrate, monitor, and refine strategies for readdressing the problem (pp. 1-2).

8. Provide learning experiences that include incrementally structured practice in moving students toward generating their ideas and theories about course material. This can be accomplished by using Grow's (1991) model of self-directed learning and through utilizing learning contracts within class structures so that students can learn the skills necessary for self-direction. Likewise, many researchers (Brockett & Heimstra, 1991; Candy, 1991; Garrison, 1997; Guglielmino, 1977; Moore, 1994) advocate putting more of the responsibility for learning onto the students as a way of increasing learner self-directedness and promoting developmental growth.
9. Provide opportunities for students to reflect on what they've learned. This can happen at various points in the curriculum such as reflections within courses, student learning portfolios, and capstone courses.
10. This study demonstrates that students more advanced in class standing are better suited for self-directed learning. Only those students advanced in class standing and/or those scoring well on an instrument or on instruments measuring self-directedness and epistemic sophistication should be placed in courses or programs with large amounts of work completed by independent study, self-directed study, or experiential learning. The literature utilized in

this research (Kasworm, 1997; Leeb, 1983; Palumbo, 1990; Shaw, 1987) is consistent with this finding.

Implications

This exploratory study has uncovered and quantified variables linking personal epistemology and learner self-directedness. The findings of this study correlating demographic and educational variables, epistemological beliefs, and self-directedness of adult students give important insights into the developmental levels of similar adult populations. The correlations in this study revealed many implications for theory, research, and practice, and these findings will allow institutions with similar populations to make programmatic and curricular decisions.

The recommendations for future research and the recommendations for the improvement of practice presented in this chapter are pieces of a developmental bridge linking the needs of students and employers with current and proposed policies and practices of institutions of higher education providing programming to adults. As the epigraph at the beginning of Chapter 1 asserted, “we cannot simply stand on our favored side of the bridge and worry or fume about the many who have not yet passed over” (Kegan, 1994, p.62). The educational practices of higher education institutions need to meet the demands of the adult students who constitute 45 percent of those participating in higher education (Kim & Creighton, 2000; Kim et al., 1995). These policies and practices not only must assist students with meeting the demands of the educational environment and the workplace, but these policies and practices also need to prepare students to meet the demands of modern life.

As many have noted (Carnevale et al. 1990; Cristiano, 1993; Davidson & Goldberg, 2004; Spence, 2001; Walsh, 1998), constant, adaptive, and active learning and the ability to solve problems are required the modern workplace and in modern life. Helping students to develop into epistemologically sophisticated and self-directed learners is a means of assisting students in meeting these modern demands. The findings of this study and of other research suggests that as students have more exposure to the humanities and social sciences, they become more epistemologically sophisticated, more self-directed, and more prepared to meet the demands of modern life (Davidson & Goldberg, 2004; Kegan, 1994; Kintz, 1999). Mentkowski et al. (2000) pointed out that students "can develop breadth of perspective and become more integrated and differentiated . . . through a liberal arts curriculum that emphasizes a professional career as well as individual development" (p. 142).

The recommendations based on the findings of this study suggest concrete ways that universities with similar adult populations can help prepare students for the demands of modern life. Practitioners can adopt classroom practices that support the goals of epistemic growth and self-directedness. One practice is to provide delivery systems, such as role playing, interviews, and group work, that move students toward the goals of growth in personal epistemological beliefs and self-directedness. Other practices are to utilize critical thinking and problem solving exercises, to include in the curriculum learning opportunities that are incrementally structured practice in generating one's ideas and theories, to set up learning communities to help students succeed, and to include opportunities for self-reflection so that students can acknowledge, relish, and be praised for their accomplishments.

The recommendations for practice based on findings of this research suggest concrete ways that university policies can help prepare students for the demands of modern life. One policy is a conscious building of a culture that supports epistemic growth and self-directedness. In order to do this, universities can utilize an instrument or instruments to measure epistemic sophistication and self-directedness and to place students programmatically according to their needs. Institutions can develop an institutional culture that supports epistemic growth and self-directedness. The marketing and delivery of programs for adult students can surpass the goals of vocational education and expedient credentialing. Students can be placed in programs and can be nurtured in such a way that they will succeed and grow.

The policies and practices recommended in this research are key to meeting students where they are while helping them to see what they can achieve and become. The policies and practices for serving adult students over the next decade must construct a developmental bridge—one that is well anchored on both sides—"with as much respect for where it begins as for where it ends" (Kegan, 1994, p. 62).

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Appendix A.

Dissertation Utilizing the Self-Directed Learning Readiness Scale

TI: The effects of technology-mediated instructional strategies on motivation, performance, and self-directed learning

AU: Gabrielle-Donna-M
DD: 2003
SN: The-Florida-State-University (0071)
LA: ENGLISH
SO: VOLUME 65-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2571
NO: AAI3137428

TI: The correlation between self-directed learning behavior and leadership effectiveness in a business environment
AU: Connolly-Robin-A
DD: 2004
SN: Duquesne-University (0067)
LA: ENGLISH
SO: VOLUME 65-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2454
NO: AAI3140591

TI: A case study of learning during transition from formal education to professional practice: Graduates of a medical laboratory technology program
AU: Escolas-Karen-Marie
DD: 2004
SN: Columbia-University-Teachers-College (0055)
LA: ENGLISH
SO: VOLUME 65-06A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2055
NO: AAI3135333

TI: The relationship between self-directed learning readiness and resilience among graduate students
AU: Robinson-Mary-G
DD: 2003
SN: The-University-of-Tennessee (0226)
LA: ENGLISH
SO: VOLUME 65-01A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 48
NO: AAI3119302

Dissertations Utilizing the Self-Directed Learning Readiness Scale(Continued)

TI: Development of an instrument to measure self-directedness
AU: Stockdale-Susan-Leigh
DD: 2003
SN: The-University-of-Tennessee (0226)
LA: ENGLISH
SO: VOLUME 64-06A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1976
NO: AAI3092836

TI: Self-directed and collaborative online learning: Learning style and performance
AU: Fitzgerald-Clifford-Thomas
DD: 2003
SN: Boston-University (0017)
LA: ENGLISH
SO: VOLUME 64-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1612
NO: AAI3090404

TI: An investigation of the relationships of self-directed learning and learning styles among developmental reading students
AU: Ware-Sandra-Moore
DD: 2003
SN: Auburn-University (0012)
LA: ENGLISH
SO: VOLUME 64-02A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 371
NO: AAI3081608

TI: Teachers' perspectives on a self-directed staff development program based upon principles of action research
AU: Husby-Vicki-Robinson
DD: 2002
SN: University-of-Georgia (0077)
LA: ENGLISH
SO: VOLUME 63-08A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2839
NO: AAI0804232

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: The relationship between creativity and self-directed learning among adult community college students
AU: Cox-Barry-French
DD: 2002
SN: The-University-of-Tennessee (0226)
LA: ENGLISH
SO: VOLUME 63-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2433
NO: AAI3059737

TI: Self-directedness and the pursuit of expert careers by arts and cultural management graduates
AU: Roy-Denise-Charlene
DD: 2001
SN: University-of-Alberta-Canada (0351)
LA: ENGLISH
SO: VOLUME 41-01 OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 30
NO: AAIMQ69465

TI: Self-directedness, self-efficacy, intrinsic value, test anxiety and success in English for academic purposes
AU: Tuksinvarajarn-Jiraporn
DD: 2002
SN: The-University-of-Mississippi (0131)
LA: ENGLISH
SO: VOLUME 63-06A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2121
NO: AAI3058222

TI: The self-directed learning readiness of baccalaureate nursing students and faculty after one year in a problem based undergraduate nursing program
AU: Williams-Beverly
DD: 2002
SN: University-of-Alberta-Canada (0351)
LA: ENGLISH
SO: VOLUME 63-05B OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2314
NO: AAINQ68640

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: Problem-based learning instruction versus traditional instruction on self -directed learning, motivation, and grades of undergraduate computer science students
AU: LeJeune-Noel-F
DD: 2002
SN: University-of-Colorado-at-Denver (0765)
LA: ENGLISH
SO: VOLUME 63-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1740
NO: AAI3053613

TI: Technical college accounting associate degree learners and their preparedness for self-directed learning
AU: Gemignani-Michael-J
DD: 2002
SN: Capella-University (1351)
LA: ENGLISH
SO: VOLUME 63-01A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 54
NO: AAI3041421

TI: The relationship between self-directed learning and learning styles
AU: Canipe-James-Boyd
DD: 2001
SN: The-University-of-Tennessee (0226)
LA: ENGLISH
SO: VOLUME 63-01A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 53
NO: AAI3039947

TI: The relationship between self-directed learning readiness and cross-cultural adaptability in United States expatriate managers
AU: Chuprina-Larissa-A
DD: 2001
SN: The-University-of-Tennessee (0226)
LA: ENGLISH
SO: VOLUME 63-01A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 53
NO: AAI3039951

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: The relationship of two types of anxiety to self-directedness in a sample of adult education, graduate, and undergraduate students
AU: Ryan-Kevin-Cyril
DD: 1999
SN: Drake-University (0387)
LA: ENGLISH
SO: VOLUME 60-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2330
NO: AAI9940728

TI: Readiness for self-directed learning in Saudi Arabian students
AU: Abou-Rokbah-Eihab-Hassan
DD: 2002
SN: University-of-Missouri --Saint-Louis (0481)
LA: ENGLISH
SO: VOLUME 62-12A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4022
NO: AAI3035644

TI: The effects of an interactive television environment on the learning preferences, attitudes, and academic achievement of fifth- and seventh-grade students in a social studies and science classroom
AU: Bowes-Kathleen-A
DD: 2002
SN: Wilmington-College-Delaware (1215)
LA: ENGLISH
SO: VOLUME 62-11A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3748
NO: AAI3032152

TI: Motivational components of self-directed learning among undergraduate students
AU: McCall-David-Lee
DD: 2002
SN: University-of-Missouri --Saint-Louis (0481)
LA: ENGLISH
SO: VOLUME 62-10A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3267
NO: AAI3029729

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: Linking differences in self-directed learning competency to dyadic conflict: An instrumental case study of the leadership dyad of John Lennon and Paul McCartney
AU: Kopp-David-Marshall
DD: 2001
SN: Barry-University-School-of-Education (1309)
LA: ENGLISH
SO: VOLUME 62-09A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2971
NO: AAI3027393

TI: Effects of short-term aerobic exercise on older women's attitude toward learning
AU: Presley-Johnny-Dee
DD: 2001
SN: The-University-of-Southern-Mississippi (0211)
LA: ENGLISH
SO: VOLUME 62-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2315
NO: AAI3021035

TI: Self-directed learning and learner-control sequencing: An examination of the relationship between two instructional delivery systems and the acquisition and application of subject matter for teacher candidates
AU: Ratcliff-Martha-Ellen
DD: 2001
SN: Louisiana-State-University-and-Agricultural-and-Mechanical-College (0107)
LA: ENGLISH
SO: VOLUME 62-06A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2084
NO: AAI3016574

TI: Predicting self-directed learning from personality type
AU: Johnson-Arthur-Hudson
DD: 2001
SN: Florida-Atlantic-University (0119)
LA: ENGLISH
SO: VOLUME 62-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1682
NO: AAI3014184

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: Itseohjautuvuus liiketalouden ammattikorkeakoulun atk-opetuksessa: Transformatiivisen oppimisen nakokulma English Translation: Self-directedness of students in adp-teaching in a business polytechnic: The paradigma of transformative learning
AU: Virtamo-Anneli-(Tuula)
DD: 2000
SN: Tampereen-Yliopisto-Finland (5758)
LA: Finnish
SO: VOLUME 62-03C OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 329
NO: AAIC805697

TI: The effect of a problem-based learning curriculum on students' perceptions about self-directed learning
AU: Walker-Jean-Teetson
DD: 2001
SN: The-University-of-Mississippi (0131)
LA: ENGLISH
SO: VOLUME 62-04A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1347
NO: AAI3010965

TI: An exploratory study of the impact of SES, grades, standardized tests, and parent involvement on fourth- and eighth-grade students' attitudes towards learning in a New Jersey middle school
AU: Young-Isaac-Ashley
DD: 2001
SN: Wilmington-College-Delaware (1215)
LA: ENGLISH
SO: VOLUME 62-02A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 476
NO: AAI3004828

TI: Employee readiness for self-directed learning and selected organizational variables as predictors of job performance
AU: Bromfield-Day-Donna-Patrice
DD: 2000
SN: The-University-of-Southern-Mississippi (0211)
LA: ENGLISH
SO: VOLUME 62-01A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 50
NO: AAI3000231

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: Self-direction and coping in adults with asthma
AU: Nelson-David-A
DD: 2000
SN: The-University-of-Tennessee (0226)
LA: ENGLISH
SO: VOLUME 61-09A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3440
NO: AAI9985656

TI: The impact of three dimensions of family life (home, work, and academic competence) on single-career and dual-career families: A case study in Java, Indonesia
AU: Siswanto-Yasin
DD: 1999
SN: Syracuse-University (0659)
LA: ENGLISH
SO: VOLUME 61-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1184
NO: AAI9964526

TI: AN EXAMINATION OF THE RELATIONSHIP BETWEEN NURSES' LEARNING PREFERENCES AND PRACTICES (PROFESSIONAL DEVELOPMENT, CONTINUING EDUCATION)
AU: MCCARTEN-KATHRYN-J-CARTER
DD: 1999
SN: FLORIDA-ATLANTIC-UNIVERSITY (0119)
LA: ENGLISH
SO: VOLUME 60-06A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1866
NO: AAI9936720

TI: AN ANALYSIS OF THE RELATIONSHIP BETWEEN CHRISTIAN MATURITY AND SELF-DIRECTED
LEARNING READINESS OF ASIAN WOMEN IN TARRANT COUNTY, TEXAS WOMEN'S EDUCATION)
AU: SHIMRAY-SHARY-(HSIU-TAI)-LIN
DD: 1999
SN: SOUTHWESTERN-BAPTIST-THEOLOGICAL-SEMINARY (0345)
LA: ENGLISH
SO: VOLUME 60-04A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 980
NO: AAI9925108

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: SELECTION OF INSTRUCTIONAL STRATEGIES BY RELIGIOUS EDUCATORS TO FOSTER READINESS FOR SELF-DIRECTED LEARNING IN ADULTS (LUTHERAN CHURCH MISSOURI SYNOD)
AU: ARNOLD-STEVEN-FREDERICK
DD: 1998
SN: UNIVERSITY-OF-MINNESOTA (0130)
LA: ENGLISH
SO: VOLUME 59-11A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4027
NO: AAI9913322

TI: CURIOSITY AND SELF-DIRECTED LEARNING READINESS AMONG A SAMPLE OF BACCALAUREATE NURSING STUDENTS
AU: BARNES-KAREN-LYNNE
DD: 1998
SN: THE-UNIVERSITY-OF-OKLAHOMA (0169)
LA: ENGLISH
SO: VOLUME 59-09A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3343
NO: AAI9905634

TI: READINESS FOR SELF-DIRECTED LEARNING AMONG FIRST GENERATION KOREAN-AMERICANS IN CHURCH EDUCATION SETTINGS: IMPLICATIONS FOR EDUCATIONAL MINISTRY
AU: KO-TAE-HYUNG
DD: 1998
SN: UNION-THEOLOGICAL-SEMINARY-IN-VIRGINIA (0684)
LA: ENGLISH
SO: VOLUME 59-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2428
NO: AAI9842040

TI: THE CULTURAL DIMENSION OF INDIVIDUALISM AND COLLECTIVISM AS A FACTOR IN ADULT SELF-DIRECTED LEARNING READINESS
AU: BRAMAN-ORMOND-RANDALL
DD: 1998
SN: THE-UNIVERSITY-OF-SOUTHERN-MISSISSIPPI (0211)
LA: ENGLISH
SO: VOLUME 59-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2296
NO: AAI9840817

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: A STUDY OF THE RELATIONSHIPS BETWEEN THE SELF-DIRECTED LEARNING READINESS AND JOB PERFORMANCE FOR HIGH SCHOOL PRINCIPALS
AU: YU-CHIEN
DD: 1998
SN: THE-OHIO-STATE-UNIVERSITY (0168)
LA: ENGLISH
SO: VOLUME 59-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1432
NO: AAI9834104

TI: MOVING TOWARD A LIFELONG LEARNING SOCIETY: THE RELATIONSHIP OF READINESS TO SELF-DIRECTED LEARNING AND RESOURCE SUPPORT (TAIWAN, CHINA)
AU: CHIEN-MIN-HUEI
DD: 1998
SN: UNIVERSITY-OF-SOUTH-DAKOTA (0203)
LA: ENGLISH
SO: VOLUME 59-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 775
NO: AAI9828282

TI: RELATIONSHIPS AMONG ADULT SOCIAL ROLES, FORMAL EDUCATION, PERRY
EPISTEMOLOGICAL LEVEL, AND READINESS FOR SELF-DIRECTED LEARNING (WILLIAM G. PERRY, COMMUNITY COLLEGES, ADULT STUDENTS)
AU: FULLERTON-FAYE-ELLEN
DD: 1998
SN: UNIVERSITY-OF-MISSOURI --SAINT-LOUIS (0481)
LA: ENGLISH
SO: VOLUME 59-02A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 393
NO: AAI9824639

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: A COMPARISON OF TRADITIONAL AND NON-TRADITIONAL STUDENTS ENROLLED IN A JUNIOR/COMMUNITY COLLEGE TWO-YEAR DEGREE PROGRAM ON THE MEASUREMENT OF SELF-DIRECTED LEARNING (JUNIOR COLLEGES, COMMUNITY COLLEGES, NONTRADITIONAL STUDENTS, ADULT STUDENTS)
AU: WILLIAMS-CHARLOTTE-ANN-MAYFIELD
DD: 1997
SN: THE-UNIVERSITY-OF-SOUTHERN-MISSISSIPPI (0211)
LA: ENGLISH
SO: VOLUME 59-02A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 396
NO: AAI9823916

TI: ASSOCIATION OF HISTORICAL EVENTS AND THE DEVELOPMENT OF SELF-DIRECTED LEARNING READINESS OF AMATEUR RADIO OPERATORS (RADIO)
AU: REDDING-TERRENCE-RUSSEL
DD: 1997
SN: THE-UNIVERSITY-OF-OKLAHOMA (0169)
LA: ENGLISH
SO: VOLUME 58-09A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3418
NO: AAI9810317

TI: THE EFFECTS OF PROBLEM-SOLVING ACTIVITIES USING DYNAMIC GEOMETRY COMPUTER SOFTWARE ON READINESS FOR SELF-DIRECTED LEARNING (GEOMETER'S SKETCHPAD)
AU: MELCZAREK-ROBERT-JAN
DD: 1996
SN: UNIVERSITY-OF-FLORIDA (0070)
LA: ENGLISH
SO: VOLUME 58-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2611
NO: AAI9800159

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: ORGANIZATIONAL LEARNING CLIMATE, SELF-DIRECTED LEARNER CHARACTERISTICS, AND JOB PERFORMANCE AMONG POLICE OFFICERS
AU: GARVER-CARL-RUSSELL
DD: 1996
SN: THE-PENNSYLVANIA-STATE-UNIVERSITY (0176)
LA: ENGLISH
SO: VOLUME 58-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1539
NO: AAI9732278

TI: INVESTIGATION OF PREDICTORS OF SUCCESSFUL WEIGHT LOSS IN A MORBIDLY OBESE POPULATION (OPTIFAST)
AU: TOBER-JO-ANN-LEE
DD: 1996
SN: UNIVERSITY-OF-WATERLOO-CANADA (1141)
LA: ENGLISH
SO: VOLUME 58-02B OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 657
NO: AAINN15346

TI: THE RELATIONSHIPS BETWEEN ADULT STUDENTS' PRIOR LEARNING EXPERIENCES AND READINESS FOR SELF-DIRECTED LEARNING
AU: LEBERRE-MARIA-LANING
DD: 1997
SN: GEORGE-MASON-UNIVERSITY (0883)
LA: ENGLISH
SO: VOLUME 58-02A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 361
NO: AAI9721822

TI: THE RELATIONSHIP BETWEEN WELLNESS AND SELF-DIRECTED LEARNING AMONG GRADUATE STUDENTS
AU: OWEN-THOMAS-ROSS
DD: 1996
SN: THE-UNIVERSITY-OF-TENNESSEE (0226)
LA: ENGLISH
SO: VOLUME 57-10A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4288
NO: AAI9709047

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: TEMPERAMENT TYPE AND SELF-DIRECTED LEARNING IN OLDER WOMEN (ELDERLY)
AU: FREED-RUTH-L-JENSEN
DD: 1997
SN: THE-UNIVERSITY-OF-NEBRASKA --LINCOLN (0138)
LA: ENGLISH
SO: VOLUME 58-04A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1402
NO: AAI9730269

TI: THE RELATIONSHIP OF SELF-DIRECTED LEARNING READINESS TO MORAL DEVELOPMENT STAGES OF ADULTS
AU: LETT-MARY-JANE
DD: 1995
SN: TEXAS-WOMAN'S-UNIVERSITY (0925)
LA: ENGLISH
SO: VOLUME 57-01A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 71
NO: AAI9615485

TI: THE CONTRIBUTION OF SELF-DIRECTED LEARNING READINESS TO THE ACHIEVEMENT OF JUNIOR STUDENTS AT A BRANCH OF THE STATE OF FLORIDA UNIVERSITY SYSTEM
AU: OGAZON-AGUEDA-GRANDE
DD: 1995
SN: FLORIDA-INTERNATIONAL-UNIVERSITY (1023)
LA: ENGLISH
SO: VOLUME 56-12A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4676
NO: AAI9610895

TI: A STUDY OF TRAINEE ATTITUDE VARIABLES AS RELATED TO LOCUS AND SELF-DIRECTEDNESS
AU: GOSSMAN-DAVID-C
DD: 1995
SN: NOVA-SOUTHEASTERN-UNIVERSITY (1191)
LA: ENGLISH
SO: VOLUME 56-11A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4257
NO: AAI9608643

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: THE RELATIONSHIP BETWEEN SELF-DIRECTED LEARNING READINESS AND ACADEMIC PERFORMANCE IN A NONTRADITIONAL HIGHER EDUCATION PROGRAM
AU: MORRIS-SCOTT-SCHROEDER
DD: 1995
SN: THE-UNIVERSITY-OF-OKLAHOMA (0169)
LA: ENGLISH
SO: VOLUME 56-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1626
NO: AAI9530074

TI: TRANSITION ISSUES FOR HIGH SCHOOL SPECIAL EDUCATION GRADUATES: A CRITICAL PERSPECTIVE
AU: BULIK-ROBERT-JOHN
DD: 1995
SN: THE-UNIVERSITY-OF-WISCONSIN --MADISON (0262)
LA: ENGLISH
SO: VOLUME 56-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1734
NO: AAI9525946

TI: READINESS FOR CONTINUED LEARNING AND EMPOWERED NURSING PRACTICE AMONG GRADUATING NURSING STUDENTS OF ASSOCIATE AND BACCALAUREATE DEGREE PROGRAMS
AU: GEORGE-RAJAMMA-VARGHESE
DD: 1995
SN: VIRGINIA-POLYTECHNIC-INSTITUTE-AND-STATE-UNIVERSITY (0247)
LA: ENGLISH
SO: VOLUME 56-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 795
NO: AAI9524779

TI: READINESS FOR SELF-DIRECTED LEARNING AND ACHIEVEMENT OF THE STUDENTS OF UNIVERSITAS TERBUKA (THE INDONESIAN OPEN LEARNING UNIVERSITY)
AU: DARMAYANTI-TRI
DD: 1994
SN: UNIVERSITY-OF-VICTORIA-CANADA (0244)
LA: ENGLISH
SO: VOLUME 33-04 OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1061
NO: AAIMM93532

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: AN EXPLORATION OF ADULT PERCEPTION OF DETERRENTS TO PARTICIPATION AND SELF-DIRECTED LEARNING READINESS
AU: WOOD-JOANNE-M
DD: 1994
SN: THE-UNIVERSITY-OF-TENNESSEE (0226)
LA: ENGLISH
SO: VOLUME 55-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1800
NO: AAI9432248

TI: AIKUINEN OMAN OPPIMISENSA OHJAAJANA: ITSEOHJAUTUVUUS, SEN KEHITTYMINEN JA YHTEYS OPPIMISTULOKSIIN KASVATUSTIETEEN AVOIMEN KORKEAKOULUOPETUKSEN MONIMUOTOKOKEILUSSA
English Translation:
ADULTS AS MANAGERS OF THEIR OWN LEARNING: SELF-DIRECTIVENESS, ITS DEVELOPMENT AND CONNECTION WITH THE COGNITIVE LEARNING RESULTS OF AN EXPERIMENT ON DISTANCE EDUCATION FOR THE TEACHING OF EDUCATIONAL SCIENCE
AU: KORO-JUKKA
DD: 1993
SN: JYVASKYLAN-YLIOPISTO-FINLAND (0979)
LA: FINNISH
SO: VOLUME 55-04C OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1032
NO: AAIC370283

TI: SUCCESS IN DISTANCE EDUCATION COURSES VERSUS TRADITIONAL CLASSROOM EDUCATION COURSES
AU: ANDERSON-MICHAEL-ROLAND
DD: 1993
SN: OREGON-STATE-UNIVERSITY (0172)
LA: ENGLISH
SO: VOLUME 54-12A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4339
NO: AAI9413704

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: A QUASI-EXPERIMENTAL STUDY OF 5TH-GRADERS' USE OF SELECTED SELF-DIRECTING PERCEPTIONS AND LEARNING STRATEGIES (FIFTH GRADERS, STUDY SKILLS)
AU: LANE-PAM-S
DD: 1992
SN: UNIVERSITY-OF-NORTH-TEXAS (0158)
LA: ENGLISH
SO: VOLUME 54-04A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1232
NO: AAI9311320

TI: SELF-DIRECTED LEARNERS: PSYCHOLOGICAL TYPE, LOCUS-OF-CONTROL AND SELECTED DEMOGRAPHIC CHARACTERISTICS
AU: WILSON-LAVETTA-JOYCE-EURE
DD: 1992
SN: THE-UNIVERSITY-OF-SOUTHERN-MISSISSIPPI (0211)
LA: ENGLISH
SO: VOLUME 54-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 781
NO: AAI9321747

TI: CHILDHOOD EXPERIENCES AND ADULT SELF-DIRECTED LEARNING (ADULT LEARNERS)
AU: STUBBLEFIELD-CLAIRE-HARKINS
DD: 1992
SN: THE-UNIVERSITY-OF-OKLAHOMA (0169)
LA: ENGLISH
SO: VOLUME 54-02A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 404
NO: AAI9311019

TI: ASSOCIATION OF PARENT-CHILD SELF-DIRECTED LEARNING READINESS: AN EXPLORATORY STUDY
AU: CLOUD-DONNA-LEACH
DD: 1992
SN: THE-UNIVERSITY-OF-OKLAHOMA (0169)
LA: ENGLISH
SO: VOLUME 53-12A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4170
NO: AAI9311006

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: THE RELATIONSHIP OF HOULE'S MODES OF CONTINUING PROFESSIONAL LEARNING AND LEARNING SELF-DIRECTEDNESS IN PSYCHIATRIC NURSES (NURSING EDUCATION, HOULE CYRIL O.)
AU: VERHEY-MARILYN-PAUL
DD: 1992
SN: BOSTON-COLLEGE (0016)
LA: ENGLISH
SO: VOLUME 53-09A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3085
NO: AAI9301689

TI: AN ANALYSIS OF LOCUS-OF-CONTROL AND SELF-DIRECTED LEARNING READINESS IN RELATIONSHIP TO AGE, GENDER, AND EDUCATION LEVEL IN OLDER ADULTS
AU: ADAMS-APRIL
DD: 1992
SN: UNIVERSITY-OF-SOUTH-FLORIDA (0206)
LA: ENGLISH
SO: VOLUME 53-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2219
NO: AAI9235064

TI: AN ANALYSIS OF LOCUS-OF-CONTROL AND SELF-DIRECTED LEARNING READINESS IN RELATIONSHIP TO AGE, GENDER, AND EDUCATION LEVEL IN OLDER ADULTS
AU: ADAMS-APRIL
DD: 1992
SN: UNIVERSITY-OF-SOUTH-FLORIDA (0206)
LA: ENGLISH
SO: VOLUME 53-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2219
NO: AAI9235064

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: AN EXAMINATION OF READINESS FOR SELF-DIRECTED LEARNING AND SELECTED PERSONNEL VARIABLES AT A LARGE MIDWESTERN ELECTRONICS DEVELOPMENT AND MANUFACTURING CORPORATION (EMPLOYEE TRAINING)
AU: DURR-RICHARD-E
DD: 1992
SN: FLORIDA-ATLANTIC-UNIVERSITY (0119)
LA: ENGLISH
SO: VOLUME 53-06A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1825
NO: AAI9231896

TI: COMPARISON OF SELF-DIRECTED LEARNING READINESS SCORES AMONG NURSES IN CRITICAL-CARE AND MEDICAL-SURGICAL AREAS
AU: HANFORD-GERALDINE-ELAINE
DD: 1991
SN: CALIFORNIA-STATE-UNIVERSITY-FRESNO (6050)
LA: ENGLISH
SO: VOLUME 31-01 OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 34
NO: AAI1349397

TI: ORGANIZATIONAL LEARNING CLIMATE, SELF-DIRECTED LEARNERS, AND PERFORMANCE AT WORK (LEARNING CLIMATE)
AU: JUDE-YORK-DEBORAH-ANN
DD: 1991
SN: THE-FIELDING-INSTITUTE (0565)
LA: ENGLISH
SO: VOLUME 53-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2206
NO: AAI9220748

TI: THE EFFECT OF TRAINING GIFTED STUDENTS FOR SELF-DIRECTED LEARNING (STUDY SKILLS)
AU: MILAM-CHERYL-PERILLOUX
DD: 1991
SN: UNIVERSITY-OF-NEW-ORLEANS (0108)
LA: ENGLISH
SO: VOLUME 53-04A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1124
NO: AAI9214993

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: RELATIONSHIP OF ADULTS' FIELD-DEPENDENCE-INDEPENDENCE AND SELF-DIRECTED LEARNING (COGNITIVE STYLE)
AU: SHELLEY-RITA
DD: 1991
SN: UNIVERSITY-OF-IDAHO (0089)
LA: ENGLISH
SO: VOLUME 52-12A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4190
NO: AAI9211822

TI: STUDENT OUTCOMES: THE RELATIONSHIP OF TEACHING STYLE TO READINESS FOR SELF-DIRECTED LEARNING
AU: HUDSPETH-JERALD-HENRY
DD: 1991
SN: MONTANA-STATE-UNIVERSITY (0137)
LA: ENGLISH
SO: VOLUME 52-10A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3514
NO: AAI9205509

TI: LEARNING TO LEARN IN THE WORKPLACE: A CASE STUDY OF A TRAINING INTERVENTION IN PREPARATION FOR LEARNING THROUGH EXPERIENCE (WORKPLACE LEARNING, EXPERIENTIAL LEARNING)
AU: MATUSZAK-DAVID-JOHN
DD: 1991
SN: NORTHERN-ILLINOIS-UNIVERSITY (0162)
LA: ENGLISH
SO: VOLUME 52-08A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2790
NO: AAI9202942

TI: SELF-DIRECTED LEARNING READINESS IN MEDICAL STUDENTS AT THE OHIO STATE UNIVERSITY
AU: FRISBY-ANTHONY-JAY
DD: 1991
SN: THE-OHIO-STATE-UNIVERSITY (0168)
LA: ENGLISH
SO: VOLUME 52-08A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2896
NO: AAI9130477

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: THE SELF-DIRECTED LEARNING READINESS OF BACCALAUREATE NURSING STUDENTS (NURSING STUDENTS)
AU: ALSPACH-JOANN-GRIFFIN
DD: 1991
SN: UNIVERSITY-OF-MARYLAND-COLLEGE-PARK (0117)
LA: ENGLISH
SO: VOLUME 52-06A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1980
NO: AAI9133189

TI: THE RELATIONSHIP BETWEEN COMPUTER ANXIETY AND SELF-DIRECTEDNESS IN ADULT LEARNERS
AU: RAKES-SUSAN-BERTHA
DD: 1991
SN: THE-UNIVERSITY-OF-TEXAS-AT-AUSTIN (0227)
LA: ENGLISH
SO: VOLUME 52-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1612
NO: AAI9128336

TI: SELF-DIRECTED LEARNING READINESS AND ACTIVITIES OF THREE TYPES OF CORPORATE COMPUTER END-USERS (LEARNING READINESS, CORPORATE TRAINING)
AU: WATSON-GEORGE-L
DD: 1991
SN: BOSTON-UNIVERSITY (0017)
LA: ENGLISH
SO: VOLUME 52-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 783
NO: AAI9122873

TI: ADULT SELF-DIRECTED LEARNING, PERSONAL COMPUTER COMPETENCY, AND LEARNING STYLE: MODELS FOR MORE EFFECTIVE LEARNING (ADULT LEARNERS)
AU: BARRETT-HELEN-CHRISTINE
DD: 1991
SN: THE-FIELDING-INSTITUTE (0565)
LA: ENGLISH
SO: VOLUME 52-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 778
NO: AAI9121829

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: THE RELATIONSHIP BETWEEN SELF-DIRECTED LEARNING READINESS, COMPLETION AND ACHIEVEMENT IN A COMMUNITY COLLEGE TELECOURSE PROGRAM
AU: HARRIMAN-JOSEPH-KIMBALL III
DD: 1990
SN: UNIVERSITY-OF-GEORGIA (0077)
LA: ENGLISH
SO: VOLUME 52-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 780
NO: AAI9117299

TI: A SELF-DIRECTED METHOD WILL ENHANCE SELF-DIRECTEDNESS IN TWO-YEAR NURSING STUDENTS
AU: STIPE-DENISE-KATHRYN
DD: 1987
SN: CALIFORNIA-STATE-UNIVERSITY-LONG-BEACH (6080)
LA: ENGLISH
SO: VOLUME 26-02 OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 247
NO: AAI1332002

TI: LOCAL AREA NETWORK IMPLEMENTATION: A DESCRIPTIVE STUDY OF TEACHERS AND STUDENTS
AU: ROURK-JAMES-ROBERT
DD: 1990
SN: KANSAS-STATE-UNIVERSITY (0100)
LA: ENGLISH
SO: VOLUME 51-08A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2719
NO: AAI9102778

TI: A STUDY OF SELF-DIRECTED LEARNING, PERCEIVED COMPETENCE AND PERSONAL ORIENTATION AMONG STUDENTS IN AN OPEN ALTERNATIVE HIGH SCHOOL
AU: POSNER-FREDRIC-G
DD: 1989
SN: UNIVERSITY-OF-DENVER (0061)
LA: ENGLISH
SO: VOLUME 51-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 813
NO: AAI9012900

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: A STUDY OF THE LEARNING BEHAVIOR OF ADULTS IN SELECTED BAPTIST CHURCHES IN TAEJON, KOREA
AU: LEE-DAN-SOKCHUL
DD: 1989
SN: SOUTHWESTERN-BAPTIST-THEOLOGICAL-SEMINARY (0345)
LA: ENGLISH
SO: VOLUME 51-02A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 468
NO: AAI9014717

TI: INFLUENCE OF UPPER DIVISION EDUCATION ON ADULT NURSING STUDENTS AS SELF-DIRECTED LEARNERS
AU: PALUMBO-DOROTHEA-VIRGINIA
DD: 1989
SN: SYRACUSE-UNIVERSITY (0659)
LA: ENGLISH
SO: VOLUME 51-02A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 382
NO: AAI9013488

TI: THE ODDI CONTINUOUS LEARNING INVENTORY: AN ALTERNATE MEASURE OF SELF-DIRECTION IN LEARNING
AU: LANDERS-KENESTON-WILLIAM JR.
DD: 1989
SN: SYRACUSE-UNIVERSITY (0659)
LA: ENGLISH
SO: VOLUME 50-12A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3824
NO: AAI9008433

TI: SELF-DIRECTED LEARNING, ACHIEVEMENT, AND SATISFACTION
AU: LANGSTON-LINDA-CUBBEDGE
DD: 1989
SN: UNIVERSITY-OF-GEORGIA (0077)
LA: ENGLISH
SO: VOLUME 50-12A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3824
NO: AAI9003421

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: A STUDY OF THE RELATIONSHIP OF SELF-DIRECTED LEARNING READINESS TO OBSERVABLE BEHAVIORAL CHARACTERISTICS IN AN ADULT BASIC EDUCATION PROGRAM
AU: JONES-CAROL-JOHNSON
DD: 1989
SN: UNIVERSITY-OF-GEORGIA (0077)
LA: ENGLISH
SO: VOLUME 50-11A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3446
NO: AAI9003456

TI: A STUDY OF THE RELATIONSHIP BETWEEN SELF-DIRECTED LEARNING READINESS AND WORK ENVIRONMENT AMONG VARIOUS STATE GOVERNMENT EMPLOYEES
AU: GARDNER-BRENDA-SUE
DD: 1989
SN: UNIVERSITY-OF-MISSOURI --COLUMBIA (0133)
LA: ENGLISH
SO: VOLUME 50-11A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3446
NO: AAI8925283

TI: SELF-DIRECTED LEARNING READINESS AND LEARNING STYLE PREFERENCES OF ADULT LEARNERS
AU: ADENUGA-BABATUNDE-O
DD: 1989
SN: IOWA-STATE-UNIVERSITY (0097)
LA: ENGLISH
SO: VOLUME 50-09A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2747
NO: AAI9003495

TI: RELATIONSHIP OF ADULTS' COGNITIVE STYLE AND ACHIEVING STYLE TO PREFERENCE FOR SELF-DIRECTED LEARNING
AU: BITTERMAN-JOAN-ASELTINE
DD: 1988
SN: NORTHERN-ILLINOIS-UNIVERSITY (0162)
LA: ENGLISH
SO: VOLUME 50-04A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 851
NO: AAI8912509

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: THE RELATIONSHIPS AMONG SELF-DIRECTED LEARNING READINESS, SELF-CARE AGENCY, AND HEALTH STATUS IN ADULTS FOUR TO EIGHT MONTHS AFTER MYOCARDIAL INFARCTION
AU: SEDORE-ANN-LUZZETTA-ZIEGLER
DD: 1988
SN: SYRACUSE-UNIVERSITY (0659)
LA: ENGLISH
SO: VOLUME 50-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 601
NO: AAI8914596

TI: LIFE SATISFACTION AND LEARNER SELF DIRECTION AS RELATED TO ETHNICITY IN THE OLDER ADULT
AU: DIAZ-PETER-CHARLES
DD: 1988
SN: THE-OHIO-STATE-UNIVERSITY (0168)
LA: ENGLISH
SO: VOLUME 50-01A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 51
NO: AAI8907209

TI: SELF-DIRECTED LEARNING: A CORRELATIONAL STUDY OF FIFTH GRADE STUDENTS, THEIR PARENTS AND TEACHERS
AU: EISENMAN-J-GORDON
DD: 1988
SN: UNIVERSITY-OF-GEORGIA (0077)
LA: ENGLISH
SO: VOLUME 49-12A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3587
NO: AAI8823790

TI: A META ANALYTIC STUDY OF ADULT SELF DIRECTION IN LEARNING: A REVIEW OF THE RESEARCH FROM 1977 TO 1987
AU: MCCUNE-SANDRA-KATHRYNE
DD: 1988
SN: TEXAS-A-and-M-UNIVERSITY (0803)
LA: ENGLISH
SO: VOLUME 49-11A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3237
NO: AAI8903377

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: AN EXAMINATION OF THE SELF-DIRECTED LEARNING READINESS OF SELECTED STUDENTS AND GRADUATES OF MASTERS DEGREE PROGRAMS OF SOUTHERN BAPTIST SEMINARIES
AU: CUNNINGHAM-JACK-RONALD
DD: 1988
SN: SOUTHWESTERN-BAPTIST-THEOLOGICAL-SEMINARY (0345)
LA: ENGLISH
SO: VOLUME 49-11A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3246
NO: AAI8827970

TI: READINESS FOR SELF-DIRECTED LEARNING IN WOMEN DURING THE FOUR STAGES OF PREGNANCY
AU: LACEY-C-LORA
DD: 1988
SN: UNIVERSITY-OF-MISSOURI --KANSAS-CITY (0134)
LA: ENGLISH
SO: VOLUME 49-09A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2496
NO: AAI8816014

TI: LEARNING PREFERENCE FOR STRUCTURE, SELF-DIRECTED LEARNING READINESS, AND INSTRUCTIONAL METHODS
AU: RUSSELL-JAN-WAMPLER
DD: 1988
SN: UNIVERSITY-OF-MISSOURI --KANSAS-CITY (0134)
LA: ENGLISH
SO: VOLUME 49-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1689
NO: AAI8814608

TI: SELF-DIRECTEDNESS, AGE, AND NONTRADITIONAL HIGHER EDUCATION
AU: MANCUSO-SUSAN-KAREN
DD: 1988
SN: UNIVERSITY-OF-WASHINGTON (0250)
LA: ENGLISH
SO: VOLUME 49-04A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 699
NO: AAI8810559

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: THE EFFECT OF A CLINICAL INTERNSHIP ON THE SELF-DIRECTED LEARNING READINESS OF BACCALAUREATE NURSING STUDENTS
AU: MURRAY-JUDITH-ANN
DD: 1987
SN: THE-UNIVERSITY-OF-IOWA (0096)
LA: ENGLISH
SO: VOLUME 49-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1036
NO: AAI8810177

TI: RELATIONSHIP OF SELF-DIRECTED LEARNING READINESS AND JOB CHARACTERISTICS TO JOB SATISFACTION FOR PROFESSIONAL NURSES
AU: MIDDLEMISS-MARY-ANN
DD: 1987
SN: SYRACUSE-UNIVERSITY (0659)
LA: ENGLISH
SO: VOLUME 49-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1035
NO: AAI8806953

TI: LEARNING STYLE PREFERENCE, SELF-DIRECTED LEARNING READINESS AND LOCUS-OF-CONTROL OF BACCALAUREATE NURSING STUDENTS
AU: LINARES-ALETTA-ZITA
DD: 1987
SN: UNIVERSITY-OF-HOUSTON (0087)
LA: ENGLISH
SO: VOLUME 49-03B OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 683
NO: AAI8806223

TI: TRANSFER OF TRAINING AND SELF-DIRECTED LEARNING IN ADULT SUNDAY SCHOOL CLASSES IN SIX CHURCHES OF CHRIST
AU: CRAIN-MATTHEW-KENT
DD: 1987
SN: SOUTHWESTERN-BAPTIST-THEOLOGICAL-SEMINARY (0345)
LA: ENGLISH
SO: VOLUME 49-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 405
NO: AAI8806936

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: EFFECTS OF A SELF-DIRECTED LEARNING GROUP EXPERIENCE ON THE SELF-DIRECTED LEARNING READINESS AND SELF-CONCEPTS OF ADULT BASIC EDUCATION STUDENTS AND GENERAL EDUCATIONAL DEVELOPMENT STUDENTS
AU: RUTLAND-ADONNA-MCCRORY
DD: 1987
SN: FLORIDA-ATLANTIC-UNIVERSITY (0119)
LA: ENGLISH
SO: VOLUME 49-01A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 29
NO: AAI8802811

TI: PATTERNS OF SELF-DIRECTED PROFESSIONAL LEARNING OF REGISTERED NURSES
AU: GRAEVE-ELIZABETH-ANNE
DD: 1987
SN: UNIVERSITY-OF-MINNESOTA (0130)
LA: ENGLISH
SO: VOLUME 48-04A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 820
NO: AAI8709556

TI: THE CONSISTENCY OF TEACHER JUDGMENT AND THE DEGREE OF CEREBRAL DOMINANCE IN IDENTIFYING SELF-DIRECTED LEARNING READINESS IN REGULAR AND GIFTED STUDENTS
AU: HUDSON-WANDA-SMITH
DD: 1986
SN: PEABODY-COLLEGE-FOR-TEACHERS-OF-VANDERBILT-UNIVERSITY (0074)
LA: ENGLISH
SO: VOLUME 48-02A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 341
NO: AAI8709423

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: AN EXPLORATORY STUDY OF THE RELATIONSHIP BETWEEN ORGANIZATIONAL CLIMATE AND SELF-DIRECTED LEARNING AMONG ORGANIZATIONAL MANAGERS
AU: YOUNG-DEBORAH-JANE
DD: 1986
SN: UNIVERSITY-OF-MISSOURI --KANSAS-CITY (0134)
LA: ENGLISH
SO: VOLUME 47-10A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3638
NO: AAI8627068

TI: SELF-DIRECTED LEARNING AS A FUTURE TRAINING MODE IN ORGANIZATIONS
AU: RAVID-GAD
DD: 1986
SN: UNIVERSITY-OF-TORONTO-CANADA (0779)
LA: ENGLISH
SO: VOLUME 47-06A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1993
NO: AAI0559049

TI: A STUDY OF THE USE OF THE SELF-DIRECTED LEARNING READINESS SCALE AS RELATED TO SELECTED ORGANIZATION VARIABLES

DD: 1986
SN: THE-GEORGE-WASHINGTON-UNIVERSITY (0075)
LA: ENGLISH
SO: VOLUME 47-04A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1218
NO: AAI8607883

TI: CURRICULUM PLANNING FOR SELF-DIRECTED LEARNING IN NURSING EDUCATION (INDEPENDENT, SELF-MOTIVATED, DISCOVERY)
AU: MALIN-AUDREY
DD: 1985
SN: STATE-UNIVERSITY-OF-NEW-YORK-AT-BUFFALO (0656)
LA: ENGLISH
SO: VOLUME 47-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1592
NO: AAI8612220

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: THE SELF-DIRECTEDNESS AND MOTIVATIONAL ORIENTATION OF ADULT PART-TIME STUDENTS AT A COMMUNITY COLLEGE
AU: REYNOLDS-MICHAEL-MERLE
DD: 1985
SN: SYRACUSE-UNIVERSITY (0659)
LA: ENGLISH
SO: VOLUME 46-12A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3571
NO: AAI8524440

TI: THE SELF-DIRECTEDNESS AND ATTITUDE TOWARD MATHEMATICS OF YOUNGER AND OLDER UNDERGRADUATE MATHEMATICS STUDENTS
AU: MCCARTHY-WILLIAM-FRANCIS
DD: 1985
SN: SYRACUSE-UNIVERSITY (0659)
LA: ENGLISH
SO: VOLUME 46-11A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3279
NO: AAI8524428

TI: THE RELATIONSHIP BETWEEN READINESS FOR, AND INVOLVEMENT IN, SELF-DIRECTED LEARNING
AU: HALL-JOHNSEN-KAREN-J
DD: 1985
SN: IOWA-STATE-UNIVERSITY (0097)
LA: ENGLISH
SO: VOLUME 46-09A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2522
NO: AAI8524657

TI: AN EXPLORATORY STUDY OF LEARNING STYLE VARIABLES RELATED TO SUCCESS OR FAILURE IN SELF-DIRECTED INDEPENDENT STUDY AMONG INTELLECTUALLY GIFTED STUDENTS MODALITY, FIELD INDEPENDENCE/DEPENDENCE, COGNITIVE STYLE, INSTRUCTIONAL (PREFERENCES)
AU: CARNEY-FAY-MARIE
DD: 1985
SN: MICHIGAN-STATE-UNIVERSITY (0128)
LA: ENGLISH
SO: VOLUME 46-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1873
NO: AAI8520508

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: THE RELATIONSHIP OF RACE, SEX, AND LOCUS OF CONTROL TO SELF-DIRECTED LEARNING (LEARNING PROCESS, TEACHING METHOD, INTERNALITY, READINESS SCALE, ADULT NOWICKI-STRICKLAND, INTERNAL-EXTERNAL SCALE)
AU: YOUNG-LUGENIA-DIXON
DD: 1985
SN: UNIVERSITY-OF-GEORGIA (0077)
LA: ENGLISH
SO: VOLUME 46-07A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1886
NO: AAI8519689

TI: A CONSTRUCT VALIDATION OF THE SELF-DIRECTED LEARNING READINESS SCALE WITH LABOUR EDUCATION PARTICIPANTS
AU: FINESTONE-PETER-MICHAEL
DD: 1984
SN: UNIVERSITY-OF-TORONTO-CANADA (0779)
LA: ENGLISH
SO: VOLUME 46-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1160
NO: AAI0556274

TI: ENHANCING READINESS FOR SELF-DIRECTED LEARNING IN ELEMENTARY GIFTED CHILDREN (INDEPENDENT STUDY, SELF-INSTRUCTION, DISCOVERY LEARNING)
AU: TAYLOR-ROBERT-RUSSELL
DD: 1984
SN: UNIVERSITY-OF-GEORGIA (0077)
LA: ENGLISH
SO: VOLUME 45-06A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1697
NO: AAI8421160

TI: SELF-DIRECTED LEARNING AND GROWTH TOWARD PERSONAL RESPONSIBILITY: IMPLICATIONS FOR A FRAMEWORK FOR HEALTH PROMOTION (PERRY SCHEME)
AU: LEEB-JANET-GRANT
DD: 1983
SN: SYRACUSE-UNIVERSITY (0659)
LA: ENGLISH
SO: VOLUME 45-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 724
NO: AAI8410729

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: SELF-DIRECTED LEARNING READINESS OF NORTHWEST MISSOURI FARMERS AS RELATED TO LEARNING RESOURCE CHOICE AND VALUING
AU: BAYHA-RICHARD-ALAN
DD: 1983
SN: KANSAS-STATE-UNIVERSITY (0100)
LA: ENGLISH
SO: VOLUME 45-01A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 50
NO: AAI8402065

TI: THE ANALYSIS OF SELF-DIRECTED LEARNING READINESS CHARACTERISTICS IN OLDER ADULTS ENGAGED IN FORMAL LEARNING ACTIVITIES IN TWO SETTINGS
AU: CURRY-MARGARET-ANN
DD: 1983
SN: KANSAS-STATE-UNIVERSITY (0100)
LA: ENGLISH
SO: VOLUME 44-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1293
NO: AAI8321092

TI: SELF-DIRECTED LEARNING READINESS OF STUDENTS AND GRADUATES OF AN ASSOCIATE DEGREE NURSING PROGRAM
AU: BOX-BARBARA-JEAN
DD: 1982
SN: OKLAHOMA-STATE-UNIVERSITY (0664)
LA: ENGLISH
SO: VOLUME 44-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 679
NO: AAI8315680

TI: SELF-DIRECTED LEARNING READINESS AND LIFE SATISFACTION AMONG OLDER ADULTS
AU: BROCKETT-RALPH-GROVER
DD: 1982
SN: SYRACUSE-UNIVERSITY (0659)
LA: ENGLISH
SO: VOLUME 44-01A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 42
NO: AAI8310448

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: EFFECTS OF A SELF-DIRECTED LEARNING PROJECT AND PREFERENCE FOR STRUCTURE ON THE SELF-DIRECTED LEARNING READINESS OF BACCALAUREATE NURSING STUDENTS
AU: WILEY-KATHERINE-RUDOLPH
DD: 1981
SN: NORTHERN-ILLINOIS-UNIVERSITY (0162)
LA: ENGLISH
SO: VOLUME 43-01A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 49
NO: AAI8209241

TI: AN INVESTIGATION OF THE LEARNING PROJECTS AMONG ADULTS OF HIGH AND LOW READINESS FOR SELF-DIRECTION IN LEARNING
AU: HASSAN-AWATIF-MOHAMED
DD: 1981
SN: IOWA-STATE-UNIVERSITY (0097)
LA: ENGLISH
SO: VOLUME 42-09A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3838
NO: AAI8128826

TI: THE RELATIONSHIPS BETWEEN INVOLVEMENT OF PROFESSIONAL NURSES IN SELF-DIRECTED LEARNING ACTIVITIES, LOCI OF CONTROL, AND READINESS FOR SELF-DIRECTED LEARNING MEASURES
AU: SKAGGS-BETTY-JEAN
DD: 1981
SN: THE-UNIVERSITY-OF-TEXAS-AT-AUSTIN (0227)
LA: ENGLISH
SO: VOLUME 42-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1906
NO: AAI8119376

TI: COGNITIVE STYLE AS INDICATED BY SELF-REPORT, PHYSIOLOGICAL, AND PERFORMANCE REPRESENTATIONS OF HEMISPHERICITY
AU: FULBRIGHT-MARTHA-YEATTS-SCRUGGS
DD: 1980
SN: TEXAS-A-and-M-UNIVERSITY (0803)
LA: ENGLISH
SO: VOLUME 41-10A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4335
NO: AAI8108010

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: DEVELOPMENT OF THE SELF-DIRECTED LEARNING READINESS SCALE.
AU: GUGLIELMINO-LUCY-MADSEN
DD: 1977
SN: UNIVERSITY-OF-GEORGIA (0077)
LA: ENGLISH
SO: VOLUME 38-11A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 6467
NO: AAI7806004

Appendix B.

Dissertation Utilizing the Schommer Epistemological Questionnaire

Dissertations Utilizing the Schommer Epistemological Questionnaire

TI: Students' reflections on mathematical learning: Results from a longitudinal study
AU: Francisco-John-M
LA: ENGLISH
SO: VOLUME 65-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1708
NO: AAI3134147

TI: A multi-method exploration of the mathematics teaching efficacy and epistemological beliefs of elementary preservice and novice teachers
AU: Esterly-Elizabeth-J
LA: ENGLISH
SO: VOLUME 65-01A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 66
NO: AAI3119231

TI: The epistemological and learning beliefs of students at a small rural community college in western Illinois
AU: Shinn-David-Delap
LA: ENGLISH
SO: VOLUME 64-09A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3194
NO: AAI3105719

TI: The impact of epistemology, motivation, and metacognition on performance in case-based classes
AU: Dutton-Rebecca-Elizabeth
LA: ENGLISH
SO: VOLUME 64-04A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1172
NO: AAI3088471

TI: Effects of epistemological beliefs and reciprocal teaching and social learning on minority secondary students' attitudes toward science
AU: Emekli-Galvin-Mahi-Suzanne
LA: ENGLISH
SO: VOLUME 63-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1687
NO: AAI3056138

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: Personal epistemological beliefs in the high school classroom
AU: Radigan-Judy-Anne
LA: ENGLISH
SO: VOLUME 63-02A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 499
NO: AAI3042445

TI: Development of metacognition and cognitive complexity in beginning group counselors
AU: Mieling-Gail-G
LA: ENGLISH
SO: VOLUME 62-10A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3294
NO: AAI3030914

TI: A multiple regression analysis of self-regulated learning, epistemology, and student achievement
AU: Monetti-David-Michael
LA: ENGLISH
SO: VOLUME 62-10A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3294
NO: AAI3028477

TI: Culture and epistemology: An investigation of different patterns in epistemological beliefs across cultures
AU: Tasaki-Katsuya
LA: ENGLISH
SO: VOLUME 62-02A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 463
NO: AAI3005226

TI: Epistemic beliefs and comprehension in a hypertext system
AU: MacNeal-Linda-G
LA: ENGLISH
SO: VOLUME 61-12A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4718
NO: AAI9998871

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: The effects of accounting students' epistemological beliefs on structured and unstructured performance measures
AU: Castiglione-Kathie-Rogers
LA: ENGLISH
SO: VOLUME 61-05A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1720
NO: AAI9971370

TI: College students' epistemological beliefs: Differences by domain and educational level
AU: Kahn-Jeannine-O'-Rourke
LA: ENGLISH
SO: VOLUME 61-04A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1318
NO: AAI9970122

TI: Teaching science for public understanding: Developing decision-making abilities
AU: Siegel-Marcelle-A
LA: ENGLISH
SO: VOLUME 61-03A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 938
NO: AAI9966574

TI: Cartographic interpretation: Differences based upon epistemological beliefs, expertise, and spatial ability
AU: Rivera-Julio-Cesar Jr.
LA: ENGLISH
SO: VOLUME 60-12A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4548
NO: AAI9954001

TI: PRESERVICE TEACHER REFLECTIVITY AS RELATED TO SELF-ESTEEM, LOCUS OF CONTROL, AND EPISTEMOLOGICAL DEVELOPMENT
AU: SCHLENK-GEORGE-WILLIAM
LA: ENGLISH
SO: VOLUME 59-08A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2935
NO: AAI9902737

Dissertations Utilizing the Self-Directed Learning Readiness Scale (Continued)

TI: THE DEVELOPMENT OF PERSONAL EPISTEMOLOGY: DIMENSIONS, DISCIPLINARY DIFFERENCES, AND INSTRUCTIONAL PRACTICES (COLLEGE STUDENTS)
AU: HOFER-BARBARA-KAY
LA: ENGLISH
SO: VOLUME 58-10A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3832
NO: AAI9811094

TI: BELIEFS ABOUT LANGUAGE LEARNING AND THEIR RELATIONSHIP TO THE ABILITY TO INTEGRATE INFORMATION FROM MULTIPLE SOURCES IN INTERPRETING NOVEL KANJI COMPOUNDS (JAPANESE)
AU: MORI-YOSHIKO
LA: ENGLISH
SO: VOLUME 57-11A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4676
NO: AAI9712383

TI: THE NATURE OF EPISTEMOLOGICAL BELIEFS ABOUT LEARNING
AU: JEHNG-JIHN-CHANG-JOSEPH
LA: ENGLISH
SO: VOLUME 52-06A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2075
NO: AAI9124435

TI: THE EFFECTS OF BELIEFS ABOUT THE NATURE OF KNOWLEDGE ON COMPREHENSION
AU: SCHOMMER-MARLENE-ANN
LA: ENGLISH
SO: VOLUME 50-08A OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2435
NO: AAI8924938

Appendix C.

Self-Directed Learning Readiness Scale

Self-Directed Learning Readiness Scale

Instructions: This is a questionnaire designed to gather data on learning preferences and attitudes towards learning. After reading each item, please indicate the degree to which you feel that statement is true of you. Please read each choice carefully and select the circle next to the response which best expresses your feeling.
There is no time limit for the questionnaire. Try not to spend too much time on any one item, however. Your first reaction to the question will usually be the most accurate.

83. I'm looking forward to learning as long as I'm living.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

84. I know what I want to learn.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

85. When I see something that I don’t understand, I stay away from it.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

86. If there is something I want to learn, I can figure out a way to learn it.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

87. I love to learn.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

88. It takes me a while to get started on new projects.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

89. In a classroom, I expect the teacher to tell all class members exactly what to do at all times.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

90. I believe that thinking about who you are, where you are, and where you are going should be a major part of every person's education.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

91. I don’t work very well on my own.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

92. If I discover a need for information that I don’t have, I know where to go to get it.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

93. I can learn things on my own better than most people.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

94. Even if I have a great idea, I can't seem to develop a plan for making it work.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

95. In a learning experience, I prefer to take part in deciding what will be learned and how.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

96. Difficult study doesn't bother me if I'm interested in something.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

97. No one but me is truly responsible for what I learn.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

98. I can tell whether I'm learning something well or not.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

99. There are so many things I want to learn that I wish that there were more hours in a day.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

100. If there is something I have decided to learn, I can find time for it, no matter how busy I am.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

101. Understanding what I read is a problem for me.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

102. If I don’t learn, it’s not my fault.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

103. I know when I need to learn more about something.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

104. If I can understand something well enough to get a good grade on a test, it doesn't bother me if I still have questions about it.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

105. I think libraries are boring places.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

106. The people I admire most are always learning new things.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

107. I can think of many different ways to learn about a new topic.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

108. I try to relate what I am learning to my long-term goals.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

109. I am capable of learning for myself almost anything I might need to know.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

110. I really enjoy tracking down the answer to a question.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

111. I don’t like dealing with questions where there is not one right answer.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

112. I have a lot of curiosity about things.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

113. I'll be glad when I'm finished learning.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

114. I'm not as interested in learning as some other people seem to be.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

115. I don’t have any problem with basic study skills.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

116. I like to try new things, even if I’m not sure how they will turn out.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

117. I don’t like it when people who really know what they’re doing point out mistakes that I am making.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

118. I'm good at thinking of unusual ways to do things.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

119. I like to think about the future.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

120. I'm better than most people are at trying to find out the things I need to know.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

121. I think of problems as challenges, not stop signs.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

122. I can make myself do what I think I should.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

123. I am happy with the way I investigate problems.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

124. I become a leader in group learning situations.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

125. I enjoy discussing ideas.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

126. I don’t like challenging learning situations.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

127. I have a strong desire to learn new things.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

128. The more I learn, the more exciting the world becomes.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

129. Learning is fun.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

130. It's better to stick with the learning methods that we know will work instead of always trying new ones.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

131. I want to learn more so that I can keep growing as a person.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

132. I am responsible for my learning—no on else is.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

133. Learning how to learn is important to me.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

134. I will never be too old to learn new things.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

135. Constant learning is a bore.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

136. Learning is a tool for life.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

137. I learn several new things on my own each year.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

138. Learning doesn’t make any difference in my life.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

139. I am an effective learner in the classroom and on my own.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

140. Learners are leaders.

- Almost never true of me; I hardly ever feel this way.
- Not often true of me; I feel this way less than half the time.
- Sometimes true of me; I feel this way about half the time.
- Usually true of me; I feel this way more than half the time.
- Almost always true of me; there are very few times when I don't feel this way.

Next >>

Appendix D.

Schommer Epistemological Questionnaire

Schommer Epistemological Questionnaire

Directions: There are no right or wrong answers for the following questions. We want to know what you really believe. For each statement select the circle that best describes the degree to which you agree or disagree.

20. If you are ever going to be able to understand something, it will make sense to you the first time you hear it.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

21. The only thing that is certain is uncertainty itself.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

22. For success in school, it's best not to ask too many questions.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

23. A course in study skills would probably be valuable.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

24. How much a person gets out of school mostly depends on the quality of the teacher.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

25. You can believe almost everything you read.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

26. I often wonder how much my teachers really know.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

27. The ability to learn is innate.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

28. It is annoying to listen to a lecturer who cannot seem to make up his mind as to what he really believes.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

29. Successful students understand things quickly.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

30. A good teacher's job is to keep his students from wandering from the right track.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

31. If scientists try hard enough, they can find the truth to almost anything.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

32. People who challenge authority are over confident.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

33. I try my best to combine information across chapters or even across classes.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

34. The most successful people have discovered how to improve their ability to learn.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

35. Things are simpler than most professors would have you believe.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

36. The most important aspect of scientific work is precise measurement and careful work.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

37. To me, studying means getting the big ideas from the text, rather than details.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

38. Educators should know by now which is the best method, lectures or small group discussions.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

39. Going over and over a difficult textbook chapter usually won't help you understand it.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

40. Scientists can ultimately get to the truth.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

41. You never know what a book means unless you know the intent of the author.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

42. The most important part of scientific work is original thinking.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

43. If I find the time to re-read a textbook chapter, I get a lot more out of it the second time.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

44. Students have a lot of control over how much they can get out of a textbook.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

45. Genius is 10% ability and 90% hard work.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

46. I find it refreshing to think about issues that authorities can't agree on.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

47. Everyone needs to learn how to learn.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

48. When you first encounter a difficult concept in a textbook, it's best to work it out on your own.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

49. A sentence has little meaning unless you know the situation in which it is spoken.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

50. Being a good student generally involves memorizing facts.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

51. Wisdom is not knowing the answers, but knowing how to find the answers.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

52. Most words have one clear meaning.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

53. Truth is unchanging.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

54. If a person forgot details, and yet was able to come up with new ideas from a text, I would think they were bright.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

55. Whenever I encounter a difficult problem in life, I consult with my parents.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

56. Learning definitions word for word is often necessary to do well on tests.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

57. When I study, I look for the specific facts.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

58. If a person can't understand something within a short amount of time, they should keep on trying.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

59. Sometimes you just have to accept answers from a teacher even though you don't understand them.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

60. If professors would stick more to the facts and do less theorizing, one could get more out of college.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

61. I don't like movies that don't have an ending.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

62. Getting ahead takes a lot of work.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

63. It's a waste of time to work on problems which have no possibility of coming out with a clear-cut and unambiguous answer.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

64. You should evaluate the accuracy of information in a textbook, if you are familiar with the topic.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

65. Often, even advice from experts should be questioned.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

66. Some people are born good learners, others are just stuck with limited ability.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

67. Nothing is certain but death and taxes.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

68. The really smart students don't have to work hard to do well in school.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

69. Working hard on a difficult problem for an extended period of time only pays off for really smart students.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

70. If a person tries too hard to understand a problem, they will most likely just end up being confused.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

71. Almost all the information you can learn from a textbook you will get during the first reading.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

72. Usually you can figure out difficult concepts if you eliminate all outside distractions and really concentrate.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

73. A really good way to understand a textbook is to re-organize the information according to your own personal scheme.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

74. Students who are "average" in school will remain "average" for the rest of their lives.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

75. A tidy mind is an empty mind.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

76. An expert is someone who has a special gift in some area.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

77. I really appreciate instructors who organize their lectures meticulously and then stick to their plan.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

78. The best thing about science courses is that most problems have only one right answer.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

79. Learning is a slow process of building up knowledge.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

80. Today's facts may be tomorrow's fiction.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

81. Self help books are not much help.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

82. You will just get confused if you try to integrate new ideas in a textbook with knowledge you already have about a topic.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
○	○	○	○	○

Next >>

Appendix E.

Demographic and Educational Questionnaire

Demographic and Educational Questionnaire

Directions: This is a questionnaire designed to gather information about your personal and educational background. Please answer the following questions honestly and accurately. For each question, select the circle that best describes your personal and educational background. Remember, the results of this survey are anonymous.

1. In which age group do you fall?

Under 18	18-20	21-23	24-26	27-29	30-32	33-35	36-38	39-41	42-44	45-47	48-50	51-53	54-56	57-59	60 or older
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

2. Which best describes your gender?

Male	Female
○	○

3. What is your class standing?

- ○ Freshman (fewer than 28 completed semester hours and 56 credit points)
- ○ Sophomore (28-57 completed semester hours and 57-115 credit points)
- ○ Junior (58-87 completed semester hours and 116-175 credit points)
- ○ Senior (88 or more semester hours and 176 or more credit points)
- ○ Graduate Student (masters program)
- ○ Graduate Student (doctoral program)

4. In what range does your cumulative college GPA fall?

- 3.6 and above
- 3.2-3.5
- 2.8-3.1
- 2.4-2.7
- 2.3 or below

5. How do you describe yourself?

- African-American
- Caucasian
- Native American
- Asian
- Hispanic
- Other

6. What is the highest education level your mother completed?

- Elementary School
- Middle School
- High School
- Associates Degree
- Bachelor's Degree
- Graduate Degree

7. What is the highest education level your father completed?

- Elementary School
- Middle School
- High School
- Associates Degree
- Bachelor's Degree
- Graduate Degree

8. Which best describes your major field of study in your current program?

- Accounting
- Art
- Ballet
- Biology
- Business/Business Management
- Chemistry
- Communications
- Communication Disorders
- Computer Science
- Criminal Justice
- E-commerce Management
- English

- Education
- Foreign Language
- General Education
- Health and Physical Education
- History
- Human Services/Psychology
- Human Services/Sociology
- Marketing
- Math
- Music
- Organizational Management and Leadership
- Political Science/History
- Religion and Philosophy
- Zoo Science

9. How many college credit hours have you earned in the humanities (literature, art, music, history, religion, philosophy, foreign language)?

- 0
- 1-3
- 4-6
- 7-9
- 10-13
- 14 or more

10. How many college credit hours have you earned in the social and behavioral sciences (psychology, sociology, political science, government)?

- 0
- 1-3
- 4-6
- 7-9
- 10-13
- 14 or more

11. How many times have you used a learning contract or some form of self-directed learning during your college career?

- 0
- 1
- 2
- 3
- 4
- 5 or more

12. How many college credit hours have you earned through independent or one-on-one directed studies?

- 0
- 1-3
- 4-6
- 7-9
- 10-13
- 14 or more

13. How many college credit hours have you earned for experiential learning?

- 0
- 1-3
- 4-6
- 7-9
- 10-13
- 14 or more

14. Which best describes the type of program in which are you enrolled?

- Cohort (all course are taken with the same classmates)
- Non-cohort

15. Which best describes the type of college or university in which you are currently enrolled?

- Private
- Public

16. How many students attend the college or university in which you are currently enrolled?

- less than 1,000
- 1,000-5,000
- 5,100-10,000
- 10,000-20,000
- 21,000-30,000
- More than 30,000

17. Which best describes your current status?

- Single
- Married
- Divorced
- Domestic Partner
- Separated
- Other

18. Which best describes your household income last year?

- 9,999 or less
- 10,000-20,000
- 21,000-30,000
- 31,000-40,000
- 41,000-50,000
- 51,000-60,000
- 61,000-70,000
- 71,000-80,000
- 81,000-90,000
- 91,000-100,000
- More than 100,000

19. Which best describes the population size of the town or city where you live?

- 10,000 or less
- 10,000-25,000
- 26,000-40,000
- 41.000-55,000
- 55,000-70,000
- 71,000-85,000
- 86,000-100,000
- 101,000-250,000
- 251,000-500,000
- 500,000-1,000,000
- More than 1,000,000

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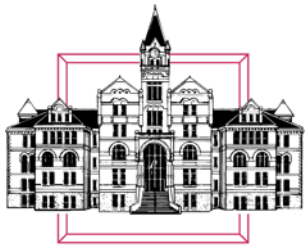
Appendix F.

Letter from Dr. Sean Warner, Dean of the College

of Adult and Professional Studies



FRIENDS
UNIVERSITY

2100 W. University St. • Wichita, Kansas 67213

[Date]

[Instructor name]
[Address]
[City, State Zip]

Dear [instructor name],

I write to ask you if we could take between 20 and 30 minutes out of your classroom time next week, so that we can do a student survey. CAPS is in the middle of a fairly large re-examination of its courses and programs, and the intent of the survey is to gain student input on some of the challenges we are facing. Its intent is to establish the degree to which our students would be willing and able to engage in some learning formats that are more self-directed than those we have at present. Our goal is not to change our existing program structures, but rather to see if we can introduce different types of "program delivery" in addition to the ones we have already.

The survey will be administered by Ms. Carrie Boden, a PACE faculty member/area coordinator, or by a designated proctor. By the time we read the instructions, and that sort of thing, it should take no more than 30 minutes. Since thirty minutes is a fairly hefty chunk of time, it makes best sense if the survey could be done either at the start of a class, or during a designated break.

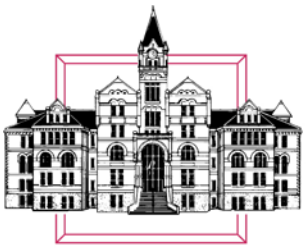
Carrie will be in touch with you to see if we can do this, and talk to you about when/if she can administer the questionnaire to your students. If I can answer any questions in the meantime, I would obviously be more than willing to do so.

Thank you,

Sean Warner, Ph. D.
Dean, College of Adult and Professional Studies
Friends University
(316) 295-5544
(800) 794-6954 ext. 5544

Appendix G.

Letter from Investigator



FRIENDS UNIVERSITY

2100 W. University St. • Wichita, Kansas 67213

[Date]

[Instructor name]
[Address]
[City, State Zip]

Dear [instructor name],

As Dr. Warner indicated in his letter to you earlier, we are in the process of conducting some exciting research in the College of Adult and Professional Studies. Individual classes were identified for participation in the study according to specific criteria, and your class has been selected. It is my hope that you will be willing to share about 30 minutes of class time on [**Day], [Month] [Date], [Year] at [Time].** The students in your class will take an electronic survey administered by **[Proctor Name]** in **[Lab #]** of the Business Technology Building. **[Proctor]** will come to your class in **[Location]** and accompany the class to the computer lab.

Please do not hesitate to contact me with questions or concerns. I appreciate your willingness to assist us in this endeavor.

Thank you in advance for your cooperation.

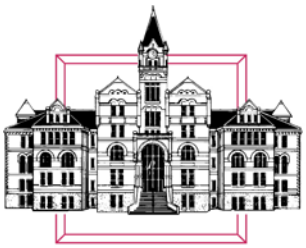
Sincerely,

Carrie J. Boden, M.F.A.
Assistant Professor of English
CAPS Coordinator, English and Languages
Friends University
(316) 295-5611
(800) 794-6954 ext. 5611
bodenc@friends.edu

Appendix H.

College of Adult and Professional Studies Survey

Protocol Instructions



FRIENDS
UNIVERSITY

2100 W. University St. • Wichita, Kansas 67213

February 1, 2005

Dear Research Assistant,

Thank you very much for contributing to this research project for the College of Adult and Professional Studies. I look forward to working with you over the next few weeks.

This packet contains:

- A copy of the letters that were sent to the classroom teachers explaining the research project
- A copy of the research schedule in Excel and Word formats
- A copy of instructor contact information
- Informed consent forms that must be signed by you and by all participants
- An email distribution list for each class you are attending
- Instructions for administering the survey
- A time sheet
- One of my business cards
- Return envelope

Once again, thank you for contributing to this project. Don't hesitate to contact me if I can be of assistance.

Sincerely,

Carrie J. Boden
Assistant Professor of English
CAPS Coordinator, English and Languages
(316) 393-4645 (cell)
(316) 295-5611 (office)
bodenc@friends.edu

College of Adult and Professional Studies
Survey Protocol Instructions

Step 1

Before you arrive at the class, sign all of the Informed Consent forms on the "Witness to Signature" line. (See Steps 5 & 6 for administering the Informed Consent Forms)

Step 2

It is important that you arrive at the assigned classroom promptly at or a little before your scheduled time to administer the survey. Be sure to introduce yourself to the classroom teacher and thank him/her for participating in the project. Each instructor was contacted by mail about a week before your scheduled class visit; both Dr. Warner and I sent letters asking the instructor to participate in the study (see enclosures). If for some reason this instructor did not receive or has not read the letters, take a few minutes to familiarize the instructor with the project. If you are uncomfortable in terms of knowing EXACTLY what to say, you can summarize the research project by using the following excerpt from Dr. Warner's letter:

> CAPS is in the middle of a fairly large re-examination of its courses and programs, and the intent of the survey is to gain student input on some of the challenges we are facing. Its intent is to establish the degree to which our students would be willing and able to engage in some learning formats that are more self-directed than those we have at present. Our goal is not to change our existing program structures, but rather to see if we can introduce different types of "program delivery" in addition to the ones we have already.

It may also be important for the instructor to know that individual classes were identified for participation in the study according to specific criteria, and this class was selected because it fills an important "slot" in the research model.

Step 3

Explain to the instructor that you will be taking the class to the Business and Technology Building Lab ____ , and the class members will return to the classroom at _____ (about 30 minutes after leaving the classroom). The instructor may choose to accompany the class to the lab or s/he can wait in the classroom (the instructor may NOT take the survey). Please give the instructor my business card, and let the instructor know that s/he can contact me with any questions, comments, or concerns.

Step 4

Introduce yourself to the class, and read the following paragraph:

> *The College of Adult and Professional Studies is seeking input from students to find out how we can best serve your needs. The research project that you are about to participate in will help us gather information that we can use to make decisions about future class offerings, the structure of our programs, and the delivery of our programs. Our goal is not to change our existing program structures, but rather to see if we can introduce different types of program delivery in addition to the ones we have already.*

Step 5

Hand out the Informed Consent Forms, and read the following paragraphs:

> *Please read this form.*
>
> *We appreciate your participation in this research. Each person who completes the survey has the opportunity to be entered in a drawing to win $100.00.*
>
> *The data gathered in this study is confidential. The Institutional Research Board at Kansas State University and the College of Adult and Professional Studies at Friends University have determined that this study poses no risk to participants.*
>
> *Students are only allowed to participate in this research once. If you have already taken this survey, please do not participate in this study a second time.*

Step 6

Allow time as needed for the students to read the form. Once the students have read the form, have them sign and date two copies of the Informed Consent Form. Read the following paragraph:

> *Please read, sign, and date this form. This form verifies that you are a willing participant in this study.*

Make sure that you have signed and dated each copy of the forms as well. Please allow each student to keep one copy of the form. Collect the other copies of the forms. Be sure that you collect one signed form for each student.

Step 7

If the class is not already meeting in a computer lab, read the following paragraph:

> *The survey you will be taking is administered online. Please follow me to Lab _____ in the Business and Technology Building.*

If the class is already in a computer lab, proceed to Step 8.

Step 8

When you arrive at the lab, log onto the instructor computer and open Microsoft Outlook. You should have a message from me. I will send a copy of the survey to each class about 30 minutes before it is scheduled to be administered. At the same time, I will also send a copy of the survey to your Friends University email account.

Once the class members have arrived at the appropriate lab, have the students log onto the computers. If a student cannot log on, contact a lab assistant to reset that student's username and password.

*****If for some reason a lab assistant is unavailable or a student is unable to log onto the Friends network, please log that student on with your username and password or with our generic student user names and passwords

User name: student1
Password: student1

User name: student2
Password: student2

Etc.

If you do this, you will have to forward the survey to the appropriate email account student1@friends.edu or to an account the student can access through web mail.

During this step you should walk around the lab to make sure that the students are all in the right place on the computer.

Step 9

Once everyone has successfully logged onto the computer, instruct the students to open Microsoft Outlook.

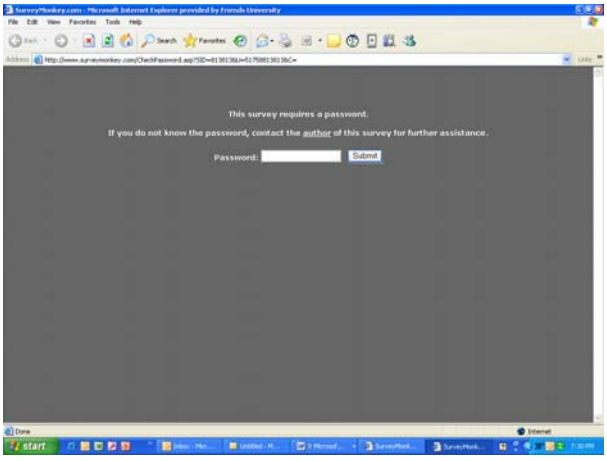
There will be a message from Carrie Boden that reads:

> Dear student,
>
> Thank you for participating in the College and Adult and Professional Studies research project. To begin the survey, follow the link below.
>
> College of Adult and Professional Studies Survey

Read the following paragraphs:

> *Open the email message from Carrie Boden and click on the enclosed link. This link should take you directly into the entry point for the survey.*
>
> *Once you are at the entry page for the survey, please wait for further instructions.*
>
> *This survey is password protected.*
>
> *Do NOT to begin taking the survey.*

At this point, the students will see the following screen.



Walk around the lab to make sure that the students are all in the right place on the computer. Then read the following:

> *Do NOT open any other programs while this survey is being administered.*

Step 10

Once everyone is at the entry point for the survey, read the following paragraphs:

> *The following survey will provide very important information to the College of Adult and Professional Studies. Please consider each question individually.*
>
> *You will only be allowed to move **forward** through this survey, and you can only select **one** answer for each question. Make sure you answer every question and that you provide the most accurate answer for each question.*
>
> *The survey is divided into three parts. **Read the directions carefully for each part.** When you reach the end of each part, click the **"Next"** button. When you reach the end of the survey, you can choose to enter a drawing to win $100.00. If you want to enter the drawing, enter your name and email address in the blanks provided. When you have completed the survey, select the **"Done"** button.*
>
> *When you complete the survey, log off of the computer and wait for further instructions.*
>
> *Begin the survey by typing in the password:* **falcons** *f-a-l-c-o-n-s.*

During this step, you should walk around the lab to make sure that the students are all in the right place. The students should NOT open ANYTHING other than the survey.

Step 11

When all of the students have finished the survey, make sure everyone has logged off of the computers. Then, accompany the students back to their classroom (unless the instructor has chosen to come to the lab).

Please thank the instructor and the students. Read the following paragraph:

> *Thank you very much for participating in this study; the information you provided will be very helpful to the College of Adult and Professional Studies. You can find out about the results of the study through contacting Professor Carrie Boden or through searching Dissertation Abstracts International after the study is completed.*

Step 12

Fill out your time sheet.

Step 13
Record how many students were present in the class, how many students have already taken the survey, and how many students declined to participate in the survey.

Step 14

Return the Informed Consent forms and time sheet to me in the provided envelope.

Appendix I.

Kansas State University Informed Consent Form

KANSAS STATE UNIVERSITY
INFORMED CONSENT

PROJECT TITLE: An Exploratory Study of the Relationship between Self-Directed Learning Readiness and Epistemological Beliefs.

PRINCIPAL INVESTIGATOR: Dr. Jacqueline D. Spears, Ph.D.
CO-INVESTIGATOR(S): Carrie J. Boden, M.F.A.

CONTACT AND PHONE FOR ANY PROBLEMS/QUESTIONS:
Jacqueline D. Spears, Ph.D., Associate Professor, 234 Bluemont Hall, Kansas State University, Manhattan, KS 66506, (785) 532-5530, jdspears@ksu.edu

IRB CHAIR CONTACT/PHONE INFORMATION:
Rick Scheidt, Chair, Committee on Research Involving Human Subjects, 1 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-7801, rscheidt@ksu.edu

SPONSOR OF PROJECT: College of Education

PURPOSE OF RESEARCH: This study will explore the relationship between epistemological beliefs and learner self-directedness. This research will contribute to the literature in the fields of adult education, self-directed learning, and personal epistemology. It is hoped that the knowledge created from this research will contribute to a deeper understanding of the relationship between epistemological beliefs and learner self-directedness and that this understanding will lead to improved models of best practice. Participants may access the results of this study through Dissertation Abstracts International.

PROCEDURE OR METHODS TO BE USED: Data will be collected via three survey instruments: a demographic and educational data questionnaire, the Self-Directed Learning Readiness Scale developed by Lucy Guglielmino, and the Epistemological Questionnaire developed by Marlene Schommer.

LENGTH OF STUDY: Approximately one hour for the completion of the online surveys.

RISKS ANTICIPATED: None

EXTENT OF CONFIDENTIALITY: Confidentiality related to all aspects of the data collected from each participant will be strictly maintained. The researcher will conduct the survey during a regularly scheduled class period.

TERMS OF PARTICIPATION: I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits or academic standing to which I may otherwise be entitled.

I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.

Participant Name: _____ **Date:** _____

Participant Signature: _____ **Date:** _____

Witness to Signature: _____ **Date:** _____

Appendix J.

Email Message sent to Participants

From: Carrie Boden
Sent: Wednesday, February 09, 2005 5:18 PM
Subject: College of Adult and Professional Studies Survey OML 284
Dear student,

Thank you for participating in the College and Adult and Professional Studies research project. To begin the survey, follow the link below.

College of Adult and Professional Studies Survey

Regards,

Carrie

Carrie J. Boden, M.F.A.
Assistant Professor of English
Friends University
2100 W. University
Wichita, KS 67213
(316) 295-5611

Appendix K.

Drawing Procedure

Drawing Procedure

Slips of paper with each participant's assigned database number were placed into a large box. Bonnie Dexter, the Division of Religion and Humanities administrative assistant at Friends University, drew one slip of paper. Dr. Darcy Zabel and the investigator were witnesses to the drawing. This number on the slip of paper was cross-referenced with the participant's assigned database number. The investigator notified the participant that she had won the drawing by email and by telephone and made arrangements for the participant to pick up a $100.00 check from Bonnie Dexter in the Religion and Humanities Division Office. The winner showed Bonnie Dexter a photo ID and signed for the check.

Appendix L.

Thank you Email Message and Notification of Drawing Winner

April 5, 2005

Dear Student,

Thank you for participating in the Friends University survey! We have now completed the data collection phase of this research, and we were able to gather information from 193 PACE, 201 DCP, and 109 CBASE students.

On March 5, 2005 the $100.00 drawing was completed, and the winner was participant number 262. Congratulations! I will be in touch the winner by email and/or by phone to make arrangements for this lucky person to collect the $100.00 prize.

Once again, thank you for your participation in this research; the information gathered will help us to better meet the educational needs of our students and to improve our courses and our programs.

I wish you luck with the remainder of your studies.

Regards,

Carrie

Carrie J. Boden, M.F.A.
Assistant Professor of English
CAPS Coordinator, English and Languages
Friends University
2100 W. University
Wichita, KS 67213
(316) 295-5611

April 5, 2005

Dear Student,

Thank you for participating in the Friends University survey! On March 5, 2005 the $100.00 drawing was completed, and you are the winner! Congratulations! Please respond to this email message and/or contact me by phone to make arrangements to collect the $100.00 prize.

Thank you for your participation in this important research; the information gathered will help us to better meet the educational needs of our students and to improve our courses and our programs.

I wish you luck with the remainder of your studies.

Regards,

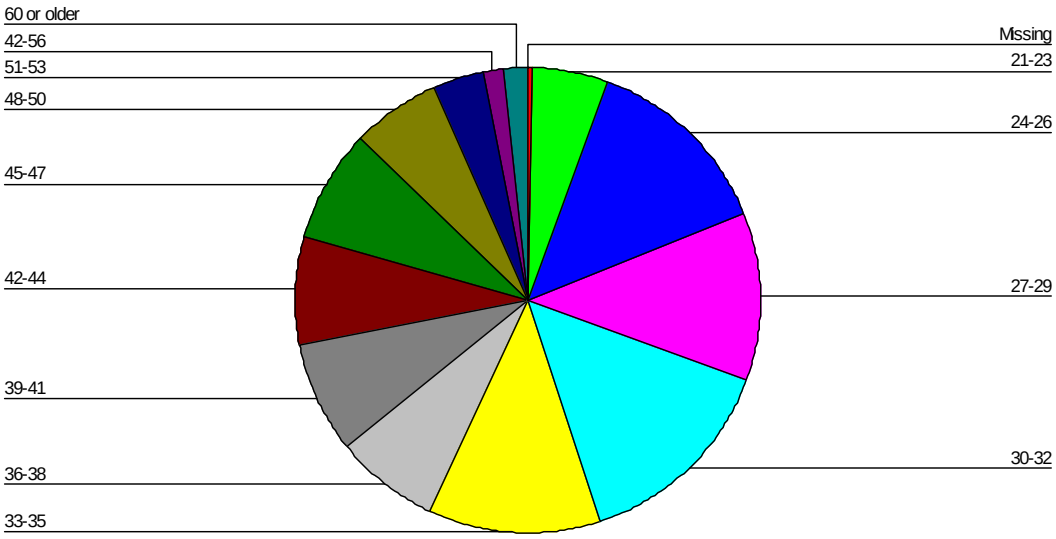
Carrie

Carrie J. Boden, M.F.A.
Assistant Professor of English
CAPS Coordinator, English and Languages
Friends University
2100 W. University
Wichita, KS 67213
(316) 295-5611

Appendix M.

Distributions of Age Across the Sample

Distributions of Age Across the Sample



Appendix N.

Frequency Distributions of Race Across the Sample

Frequency Distributions of Race Across the Sample

	Frequency	Percent
African-American	52	13.2
Caucasian	295	74.9
Native American	6	1.5
Asian	7	1.8
Hispanic	25	6.3
Other	9	2.3

Appendix O.

Frequency Distributions of Marital Status Across the Sample

Frequency Distributions of Marital Status Across the Sample

	Frequency	Percent
Single	85	21.6
Married	229	58.1
Divorced	65	16.5
Domestic Partner	8	2.0
Separated	4	1.0
Other	3	.8

Appendix P.

Frequency Distributions of Rural or Urban Residence Across the Sample

Frequency Distributions of Rural or Urban Residence Across the Sample

	Frequency	Percent
10,000 or less	42	10.7
10,000-25,000	33	8.4
26,000-40,000	10	2.5
41,000-55,000	3	.8
56,000-70,000	6	1.5
71,000-85,000	2	.5
86,000-100,000	9	2.3
101,000-250,000	21	5.3
251,000-500,000	236	59.9
501,000-1,000,000	28	7.1
More than 1,000,000	3	.8
Missing	1	.3

Appendix Q.

Frequency Distributions of Type of Program Across the Sample

Frequency Distributions of Type of Program Across the Sample		
	Frequency	Percent
Cohort	219	55.6
Non-cohort	175	44.4

Appendix R.

Frequency Distribution of SDLRS Total Scores Across the Sample

Frequency Distribution of SDLRS Total Scores Across the Sample

	Frequency	Percent
151	1	.3
154	1	.3
157	1	.3
167	1	.3
169	1	.3
173	1	.3
174	1	.3
175	1	.3
177	1	.3
178	1	.3
179	1	.3
180	2	.5
181	1	.3
182	3	.8
183	3	.8
184	2	.5
185	4	1.0
188	4	1.0
189	2	.5
190	2	.5
191	2	.5

Frequency Distribution of SDLRS Total Scores Across the Sample (Continued)

	Frequency	Percent
192	3	.8
193	2	.5
194	2	.5
195	1	.3
196	2	.5
197	3	.8
198	2	.5
200	5	1.3
201	5	1.3
202	2	.5
203	3	.8
204	1	.3
205	4	1.0
206	5	1.3
207	3	.8
208	2	.5
209	2	.5
210	3	.8
211	5	1.3
212	5	1.3
213	2	.5

Frequency Distribution of SDLRS Total Scores Across the Sample (Continued)

	Frequency	Percent
214	4	1.0
215	3	.8
216	6	1.5
217	4	1.0
218	5	1.3
219	6	1.5
220	6	1.5
221	4	1.0
222	5	1.3
223	8	2.0
224	6	1.5
225	9	2.3
226	7	1.8
227	5	1.3
228	5	1.3
229	3	.8
230	4	1.0
231	3	.8
232	2	.5
233	7	1.8
234	7	1.8

Frequency Distribution of SDLRS Total Scores Across the Sample (Continued)

	Frequency	Percent
235	5	1.3
236	3	.8
237	5	1.3
238	5	1.3
239	4	1.0
240	3	.8
241	4	1.0
242	9	2.3
243	9	2.3
244	5	1.3
245	4	1.0
246	7	1.8
247	2	.5
248	3	.8
249	2	.5
250	1	.3
251	3	.8
252	4	1.0
253	1	.3
254	4	1.0
255	2	.5

Frequency Distribution of SDLRS Total Scores Across the Sample (Continued)

	Frequency	Percent
256	3	.8
257	1	.3
258	4	1.0
259	3	.8
260	6	1.5
261	4	1.0
262	4	1.0
264	1	.3
265	6	1.5
266	4	1.0
267	3	.8
268	4	1.0
269	3	.8
270	3	.8
272	2	.5
Missing	52	13.2

Appendix S.

Frequency Distributions of SDLRS Factor 1 Across the Sample

Frequency Distributions of SDLRS Factor 1 Across the Sample

	Frequency	Percent
18	1	.3
21	1	.3
24	1	.3
25	3	.8
26	5	1.3
27	11	2.8
28	9	2.3
29	10	2.5
30	5	1.3
31	26	6.6
32	24	6.1
33	27	6.8
34	33	8.4
35	36	9.1
36	32	8.1
37	28	7.1
38	31	7.8
39	25	6.3
40	15	3.8
41	21	5.3
42	15	3.8

Frequency Distributions of SDLRS Factor 1 Across the Sample		
	Frequency	Percent
43	14	3.5
44	9	2.3
45	2	.5
Missing	11	2.8

Appendix T.

Frequency Distributions of SDLRS Factor 2 Across the Sample

Frequency Distributions of SDLRS Factor 2 Across the Sample

	Frequency	Percent
22	1	.3
23	2	.5
24	1	.3
25	1	.3
26	5	1.3
27	13	3.3
28	13	3.3
29	19	4.8
30	9	2.3
31	22	5.6
32	30	7.6
33	23	5.8
34	31	7.8
35	24	6.1
36	26	6.6
37	43	10.9
38	26	6.6
39	26	6.6
40	19	4.8
41	12	3.0
42	13	3.3

Frequency Distributions of SDLRS Factor 2 Across the Sample

	Frequency	Percent
43	17	4.3
44	7	1.8
45	2	.5
Missing	10	2.5

Appendix U.

Frequency Distributions of SDLRS Factor 3 Across the Sample

Frequency Distributions of SDLRS Factor 3 Across the Sample

	Frequency	Percent
21	1	.3
23	2	.5
24	2	.5
25	3	.8
26	4	1.0
27	3	.8
28	6	1.5
29	16	4.1
30	32	8.1
31	24	6.1
32	30	7.6
33	23	5.8
34	38	9.6
35	29	7.3
36	39	9.9
37	26	6.6
38	24	6.1
39	25	6.3
40	18	4.6
41	20	5.1
42	12	3.0

Frequency Distributions of SDLRS Factor 3 Across the Sample

	Frequency	Percent
43	7	1.8
44	3	.8
45	3	.8
Missing	5	1.3

Appendix V.

Frequency Distributions of SDLRS Factor 4 Across the Sample

Frequency Distributions of SDLRS Factor 4 Across the Sample

	Frequency	Percent
24	1	.3
25	1	.3
27	5	1.3
28	5	1.3
29	3	.8
30	5	1.3
31	9	2.3
32	17	4.3
33	14	3.5
34	19	4.8
35	27	6.8
36	23	5.8
37	29	7.3
38	40	10.1
39	30	7.6
40	23	5.8
41	29	7.3
42	18	4.6
43	21	5.3
44	23	5.8
45	16	4.1

Frequency Distributions of SDLRS Factor 4 Across the Sample

	Frequency	Percent
46	12	3.0
47	6	1.5
48	4	1.0
49	3	.8
Missing	12	3.0

Appendix W.

Frequency Distributions of SDLRS Factor 5 Across the Sample

Frequency Distributions of SDLRS Factor 5 Across the Sample

	Frequency	Percent
13	1	.3
15	2	.5
16	7	1.8
17	9	2.3
18	25	6.3
19	25	6.3
20	44	11.1
21	51	12.9
22	49	12.4
23	49	12.4
24	47	11.9
25	27	6.8
26	26	6.6
27	9	2.3
28	8	2.0
29	3	.8
30	4	1.0
Missing	9	2.3

Appendix X.

Frequency Distributions of SDLRS Factor 6 Across the Sample

Frequency Distributions of SDLRS Factor 6 Across the Sample

	Frequency	Percent
14	1	.3
15	1	.3
16	3	.8
17	4	1.0
18	6	1.5
19	13	3.3
20	17	4.3
21	24	6.1
22	32	8.1
23	41	10.4
24	32	8.1
25	50	12.7
26	35	8.9
27	39	9.9
28	22	5.6
29	26	6.6
30	19	4.8
31	12	3.0
32	3	.8
33	1	.3
34	1	.3
Missing	13	3.3

Appendix Y.

Frequency Distributions of SDLRS Factor 7 Across the Sample

Frequency Distributions of SDLRS Factor 7 Across the Sample

	Frequency	Percent
11	4	1.0
12	7	1.8
13	8	2.0
14	14	3.5
15	20	5.1
16	26	6.6
17	39	9.9
18	55	13.9
19	52	13.2
20	51	12.9
21	41	10.4
22	24	6.1
23	12	3.0
24	14	3.5
25	15	3.8
Missing	13	3.3

Appendix Z.

Frequency Distributions of SDLRS Factor 8 Across the Sample

Frequency Distributions of SDLRS Factor 8 Across the Sample

	Frequency	Percent
8	4	1.0
9	2	.5
10	9	2.3
11	19	4.8
12	35	8.9
13	40	10.1
14	60	15.2
15	74	18.7
16	56	14.2
17	31	7.8
18	30	7.6
19	14	3.5
20	12	3.0
Missing	9	2.3

Appendix AA.

Individual Item Loadings on Schommer

Epistemological Questionnaire Five Factor Solution

Individual Item Loadings on Schommer Epistemological Questionnaire
Five Factor Solution

Factor 1: Truth is Clear and Unambiguous
10) Successful students understand things quickly (valence +)
12) If scientists try hard enough, they can find the truth to almost anything (valence +)
13) People who challenge authority are overconfident (valence +)
17) The most important aspect of scientific work is precise measurement and careful work (valence +)
19) Educators should know by now which is the best method, lectures or small group (valence +)
21) Scientists can ultimately get to the truth (valence +)
33) Most words have one clear meaning (valence +)
34) Truth is unchanging (valence +)
38) When I study, I look for the specific facts (valence +)
41) If professors would stick more to the facts and do less theorizing, one could get more out of college (valence +)
44) It's a waste of time to work on problems which have no possibility of coming out with a clear cut and unambiguous answer (valence +)
53) (neg. corr.) Usually you can figure out difficult concepts if you eliminate all outside distractions and really concentrate (valence -)
58) I really appreciate instructors who organize their lectures meticulously and then stick to their plan (valence +)

Factor 2: Thinking for Yourself is a Waste of Time
23) The most important part of scientific work is original thinking (valence -)
27) I find it refreshing to think about issues that authorities can't agree on (valence -)
28) Everyone needs to learn how to learn (valence -)
30) A sentence has little meaning unless you know the situation in which it is spoken (valence -)
32) Wisdom is not knowing the answers, but knowing how to find the answers (valence -)
43) Getting ahead takes a lot of work (valence -)
45) You should evaluate the accuracy of information in a textbook, if you are familiar with the topic (valence -)
46) Often, even advice from experts should be questioned (valence -)
61) (neg. corr.) Today's facts may be tomorrow's fiction (valence -)

Factor 3: Learning does not Require Effort
24) If I find the time to reread a textbook chapter, I get a lot more out of it the second time (valence -)
26) Genius is 10% ability and 90% hard work (valence -)
28) Everyone needs to learn how to learn (valence -)
52) Almost all the information you can learn from a textbook you will get during the first reading (valence +)
62) Self-help books are not much help (valence +)

Individual Item Loadings on Schommer Epistemological Questionnaire Five Factor Solution (Continued)

Factor 4: Knowledge Should Come Quick

41) If professors would stick more to the facts and do less theorizing, one could get more out of college (valence +)
44) It's a waste of time to work on problems which have no possibility of coming out with a clear cut and unambiguous answer (valence +)
48) (neg. corr.) Nothing is certain, but death and taxes (valence -)
51) If a person tries too hard to understand a problem, they will most likely just end up being confused (valence +)
63) You will just get confused if you try to integrate new ideas in a textbook with knowledge you already have about a topic (valence +)

Factor 5: Intelligence is Static

40) Sometimes you just have to accept answers from a teacher even though you don't understand them (valence +)
49) The really smart students don't have to work hard to do well in school (valence +)
55) Students who are "average" in school will remain "average" for the rest of their lives (valence +)
56) (neg. corr.) A tidy mind is an empty mind (valence -)

Appendix AB.

Frequency Distributions of Epistemological Questionnaire

Factor 1 Across the Sample

Frequency Distributions of Epistemological Questionnaire Factor 1 Across the Sample		
	Frequency	Percent
19	1	.3
22	1	.3
25	2	.5
26	3	.8
27	1	.3
28	5	1.3
29	3	.8
30	4	1.0
31	9	2.3
32	14	3.5
33	5	1.3
34	27	6.8
35	21	5.3
36	23	5.8
37	31	7.8
38	25	6.3
39	24	6.1
40	27	6.8
41	28	7.1
42	24	6.1
43	18	4.6

Frequency Distributions of Epistemological Questionnaire Factor 1 Across the Sample (Continued)

	Frequency	Percent
44	13	3.3
45	15	3.8
46	16	4.1
47	10	2.5
48	7	1.8
49	6	1.5
50	2	.5
51	7	1.8
52	2	.5
53	3	.8
55	1	.3
63	1	.3
Missing	16	4.1

Appendix AC.

Frequency Distributions of Epistemological Questionnaire

Factor 2 Across the Sample

Frequency Distributions of Epistemological Questionnaire Factor 2 Across the Sample		
	Frequency	Percent
18	1	.3
19	3	.8
21	3	.8
22	5	1.3
23	7	1.8
24	11	2.8
25	13	3.3
26	22	5.6
27	18	4.6
28	30	7.6
29	38	9.6
30	30	7.6
31	39	9.9
32	35	8.9
33	30	7.6
34	23	5.8
35	17	4.3
36	20	5.1
37	9	2.3
38	6	1.5
39	5	1.3

Frequency Distributions of Epistemological Questionnaire Factor 2 Across the Sample (Continued)

	Frequency	Percent
40	2	.5
41	1	.3
42	1	.3
Missing	26	6.6

Appendix AD.

Frequency Distributions of Epistemological Questionnaire

Factor 3 Across the Sample

Frequency Distributions of Epistemological Questionnaire Factor 3 Across the Sample		
	Frequency	Percent
11	2	.5
12	3	.8
13	4	1.0
14	13	3.3
15	10	2.5
16	26	6.6
17	37	9.4
18	43	10.9
19	48	12.2
20	55	13.9
21	45	11.4
22	38	9.6
23	19	4.8
24	19	4.8
25	11	2.8
26	4	1.0
27	4	1.0
28	1	.3
30	1	.3
31	1	.3
32	1	.3
Missing	10	2.5

Appendix AE.

Frequency Distributions of Epistemological Questionnaire

Factor 4 Across the Sample

Frequency Distributions of Epistemological Questionnaire Factor 4 Across the Sample		
	Frequency	Percent
8	2	.5
9	1	.3
10	1	.3
11	3	.8
12	6	1.5
13	9	2.3
14	10	2.5
15	32	8.1
16	46	11.6
17	50	12.7
18	58	14.7
19	37	9.4
20	49	12.4
21	37	9.4
22	19	4.8
23	9	2.3
24	7	1.8
25	6	1.5
26	1	.3
Missing	12	3.0

Appendix AF.

Frequency Distributions of Epistemological Questionnaire

Factor 5 Across the Sample

Frequency Distributions of Epistemological Questionnaire Factor 5 Across the Sample		
	Frequency	Percent
7	4	1.0
8	14	3.5
9	42	10.6
10	51	12.9
11	79	20.0
12	87	22.0
13	51	12.9
14	32	8.1
15	14	3.5
16	7	1.8
17	1	.3
18	2	.5
Missing	11	2.8

Appendix AG.

Frequency Distributions of Class Standing Across the Sample

Frequency Distributions of Class Standing Across the Sample

	Frequency	Percent
Freshman	69	17.5
Sophomore	95	24.1
Junior	139	35.3
Senior	88	22.3
Doctoral	1	.3
Missing	2	.5

Appendix AH.

Frequency Distributions of Credits Across the Sample

Frequency Distributions of Credits Across the Sample

	Humanities Credits	Humanities Credits Percent	Social Science Credits	Social Science Credits Percent
0	30	7.6	30	7.6
1-3	24	6.1	37	9.4
4-6	66	16.8	121	30.7
7-9	72	18.3	102	25.9
10-13	84	21.3	64	16.2
14 or more	118	29.9	37	9.4
Missing			3	.8

Appendix AI.

Frequency Distributions of Learning Contract Use Across the Sample

Frequency Distributions of Learning Contract Use Across the Sample

Learning Contract Use	Frequency	Percent
0	224	56.7
1	67	17
2	52	13.2
3	27	6.8
4	2	0.5
5 or more	21	5.3
Missing	2	0.5

Appendix AJ.

Frequency Distributions of Grade Point Average Across the Sample

Frequency Distributions of Grade Point Average Across the Sample		
	Frequency	Percent
3.6 and above	176	44.7
3.2-3.5	113	28.7
2.8-3.1	63	16.0
2.4-2.7	28	7.1
2.3 or below	12	3.0
Missing	2	.5

Appendix AK.

Frequency Distributions of Gender Across the Sample

Frequency Distributions of Gender Across the Sample

	Frequency	Percent
Male	161	41
Middle School	232	59
Missing	1	

Appendix AL.

Frequency Distributions of Education Level Across the Sample

Frequency Distributions of Education Level Across the Sample

	Father's Education Level Frequency	Father's Education Level Percent	Mother's Education Level Frequency	Mother's Education Level Percent
Elementary School	9	2.3	6	1.5
Middle School	44	11.2	34	8.6
High School	215	54.4	234	59.2
Associates Degree	46	11.6	60	15.2
Bachelors Degree	44	11.1	35	8.9
Graduate Degree	34	8.6	19	4.8
Missing	3	0.8		1.8